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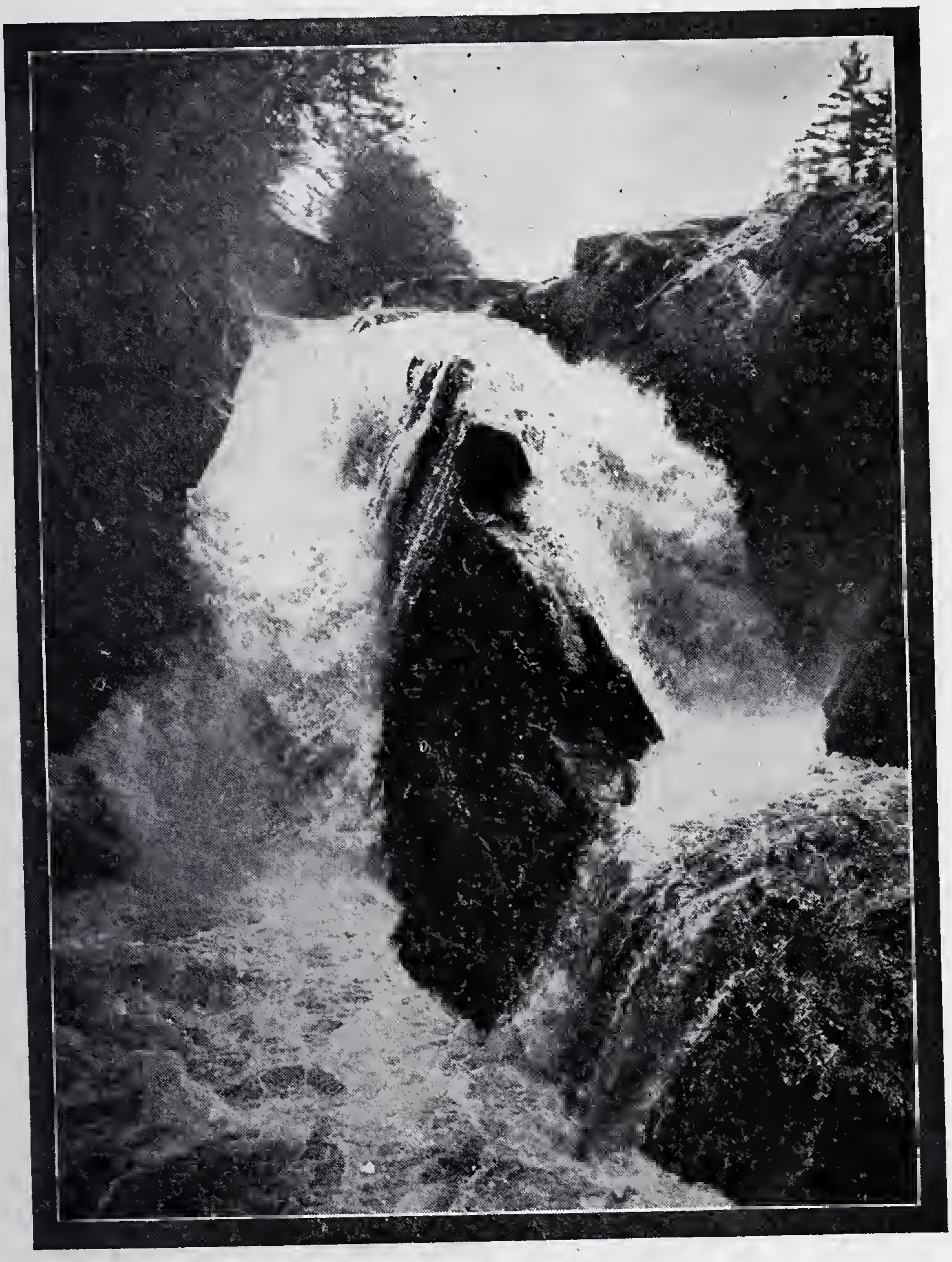
New York's Water Supply
AND ITS
Conservation, Distribution and Uses



High Falls of the Ausable River

NEW YORK STATE

WATER SUPPLY COMMISSION

ith Compliments of

CONSERVATION COMMISSION

State of New York

[Into which the former State Water Supply Commission has been merged]

New York State Water Supply Commission.

Henry H. Persons, *President*	East Aurora
John A. Sleicher	New York City
Milo M. Acker	Hornell
Charles Davis	Saugerties
Robert H. Fuller	Albany

David R. Cooper, *Secretary*	Albany

Walter McCulloh, *Consulting Engineer*	Niagara Falls

Office of the Commission: Lyon Block, Albany.

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New York's Water Supply.

I

Conservation and Distribution.

The preservation, the present use and just distribution of its water resources constitute New York State's most important problem in conservation.

In some of its branches this problem has already been solved, while in others it still awaits solution although a beginning has been made and the lines of progress have been marked out. No other question more nearly concerns the people of the State, whether as a whole or as individuals. It deserves and undoubtedly will receive the most earnest attention.

In order that it might deal adequately with the matter, the State created the State Water Supply Commission and gave it broad jurisdiction over priceless water resources.

Water seems so abundant that many persons do not reflect upon its importance or the actual limits of the supply. Yet this is of the utmost moment for upon it depend not only the agricultural and commercial prosperity of the people, but their health and their very life.

Everyone is familiar with the wonders that have been worked in the West by irrigation. Miles of desert area, destitute of vegetation and incapable of supporting human or animal life, have been converted by water drawn from storage reservoirs or from artesian wells into fertile tracts producing an abundance of fruits, corn, grain and vegetables of all kinds. This has been due alone to the magic power of water; and to obtain it tremendous labor and many millions of dollars have been expended. What it has cost the West so much to win has been in New York freely bestowed by nature.

A glance at the map of the State will show the part played by water in its development. It will be noted that from New York

City to Buffalo and from Plattsburg to Jamestown, practically all the important cities and villages are situated upon water courses, natural or artifical, or upon considerable bodies of water. Why is this so? Because when the first settlements were made both commerce and travel were confined almost wholly to navigable waters and it was natural that towns should spring up close to them. Moreover, as the community grew and manufacturing became more important, this branch of industry was dependent upon water power to turn its wheels.

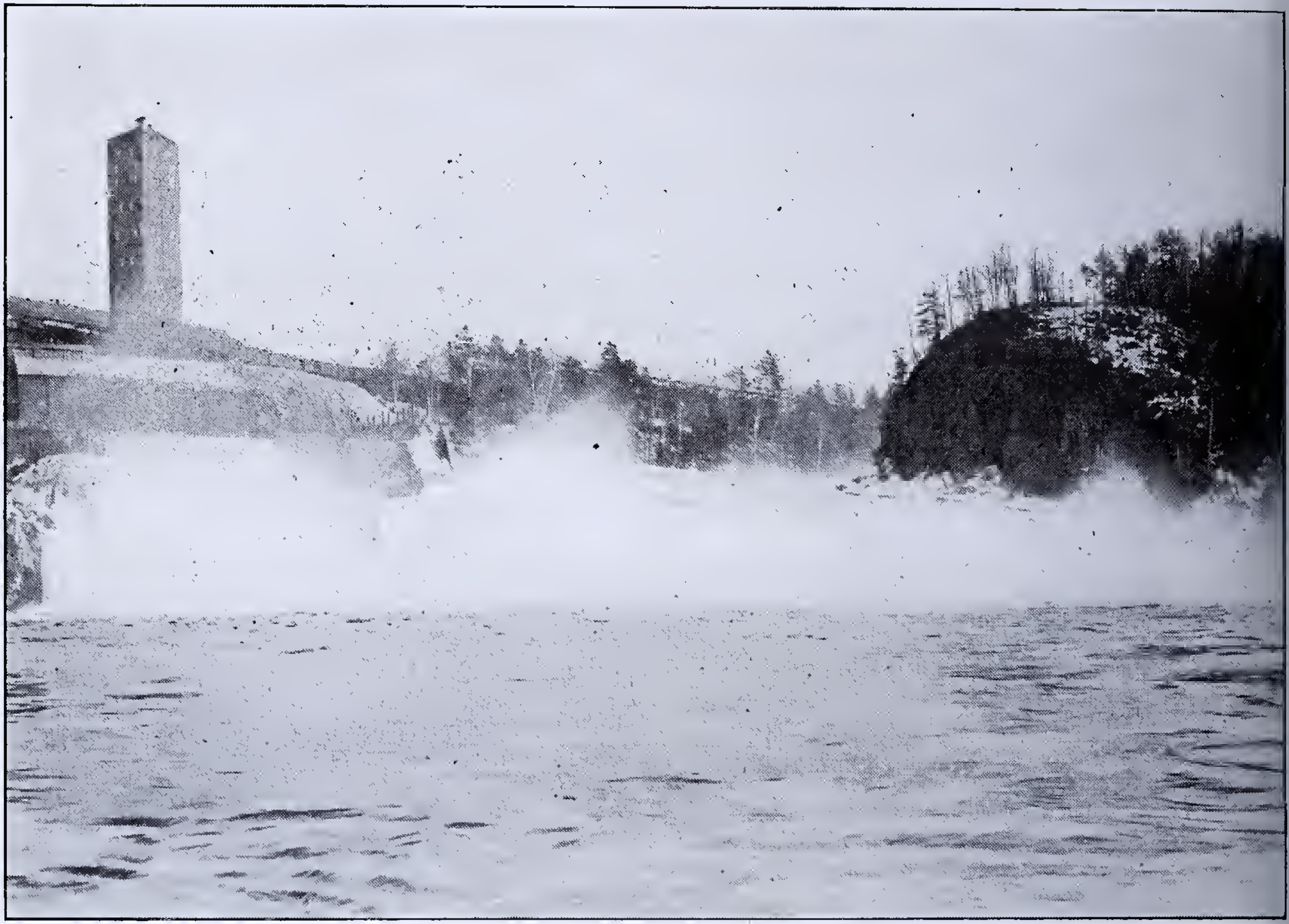
With the discovery of coal and the advent of steam, falling water ceased to be essential to manufacturing, although it has always remained the cheapest form of power. The invention of the railway rendered commerce independent of navigation, but the part played by the Great Lakes, the Erie Canal and the Hudson in keeping down railroad rates has been a valuable contribution to the welfare of the State.

For a time, therefore, the real importance of the lakes and streams was forgotten and they were degraded to serve the purpose of sewers for the cities which they had helped to bring into existence.

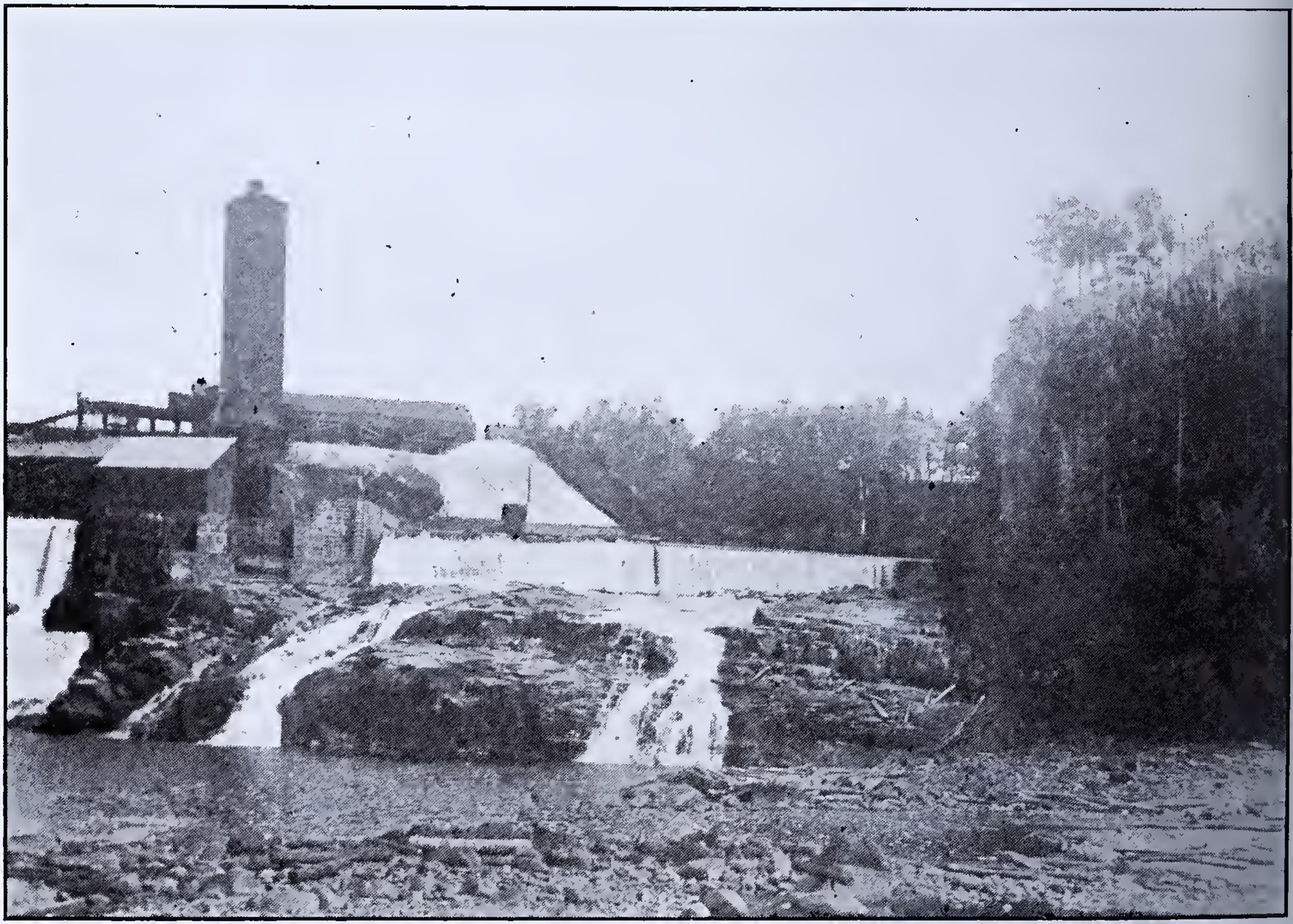
This phase of the situation is now passing and attention is rapidly turning once more to the water courses. The change has been caused chiefly by the rapid growth of the population, by the approaching exhaustion of the available coal supply and by the inventions whereby electricity for the production of light, heat and mechanical power is transmitted over long distances, bringing about an industrial revolution.

No community can exist without a sufficient supply of pure and wholesome water. As the population increased, no city and hardly a village in the State escaped the question of where to find a suitable source of water supply. The water most available was usually so contaminated by sewage or by noxious industrial wastes that it was unfit to drink. Cities have been compelled to bring water from sources many miles outside their limits, or resort to expensive processes of purification. The scarity of water thus began to make itself felt.

With the growth of industrial activity mills using water power were enlarged and new mills were built. The destruction of the



Hudson River — Palmers Falls.
High water.



Hudson River — Palmers Falls.
Low water — Showing need of river regulation.

forests at the headwaters of streams has tended to make their flow fitful and uneven. Many of them have become torrents in the Spring, pouring millions of tons daily into the sea, while in the dry summer months they shrink to rivulets. The total amount of surplus water thus wasted annually in the State is about 4,599,000,000 tons. The Spring floods not only destroy enormous amounts of property, but they carry away the water that is needed in the summer to keep the mill-wheels turning. Many mills are compelled to shut down entirely during the "dry months" while others have been forced at large expense to install auxiliary plants for generating steam power. In this respect once more the shortage of water has been felt.

Another result of the unequal stream flow caused largely by denudation is interference with navigation. Great outlays have been made and are still being made for dredging channels of sufficient depth during the dry season to float the river craft.

These difficulties have called attention sharply to the fact that the supply of water is not inexhaustible and that the water-courses are, after all, the arteries of the State.

But the wonderful development of electrical invention has also aided in restoring water power to its former importance. Before this development the number of plants which might be run by the same fall was limited by the number of sites upon the fall. Electrical transmission lines have made it possible to spread the power of the fall far and wide in the form of electrical current and the number of plants which it will serve is limited only by the amount of current that can be produced. This use of electricity, although already extensive, is still in its infancy. Farsighted business men realize that the time is not far distant when the railroads will substitute electric power for steam. There is sharp competition for the ownership of water powers that are capable of producing electric current and large sums are being invested in them.

There are indications that in the near future the value of water in agriculture will be more generally recognized in this State. The straightening and dredging of streams, preventing the waste of valuable farm lands, and the draining of swamps and marshes, have been undertaken on a large scale, both under State supervision and as private enterprises, As the value of food products increases the "back to the land" movement seems certain to keep pace with it. The State is making large annual appropriations for education in its agricultural schools and colleges, and its agricultural exeriment stations are seeking out the best method of production. A very large number of farms possess an actual or potential water supply capable of being employed to increase the productiveness of the farm through irrigation or to furnish cheap motive power for labor-saving devices.

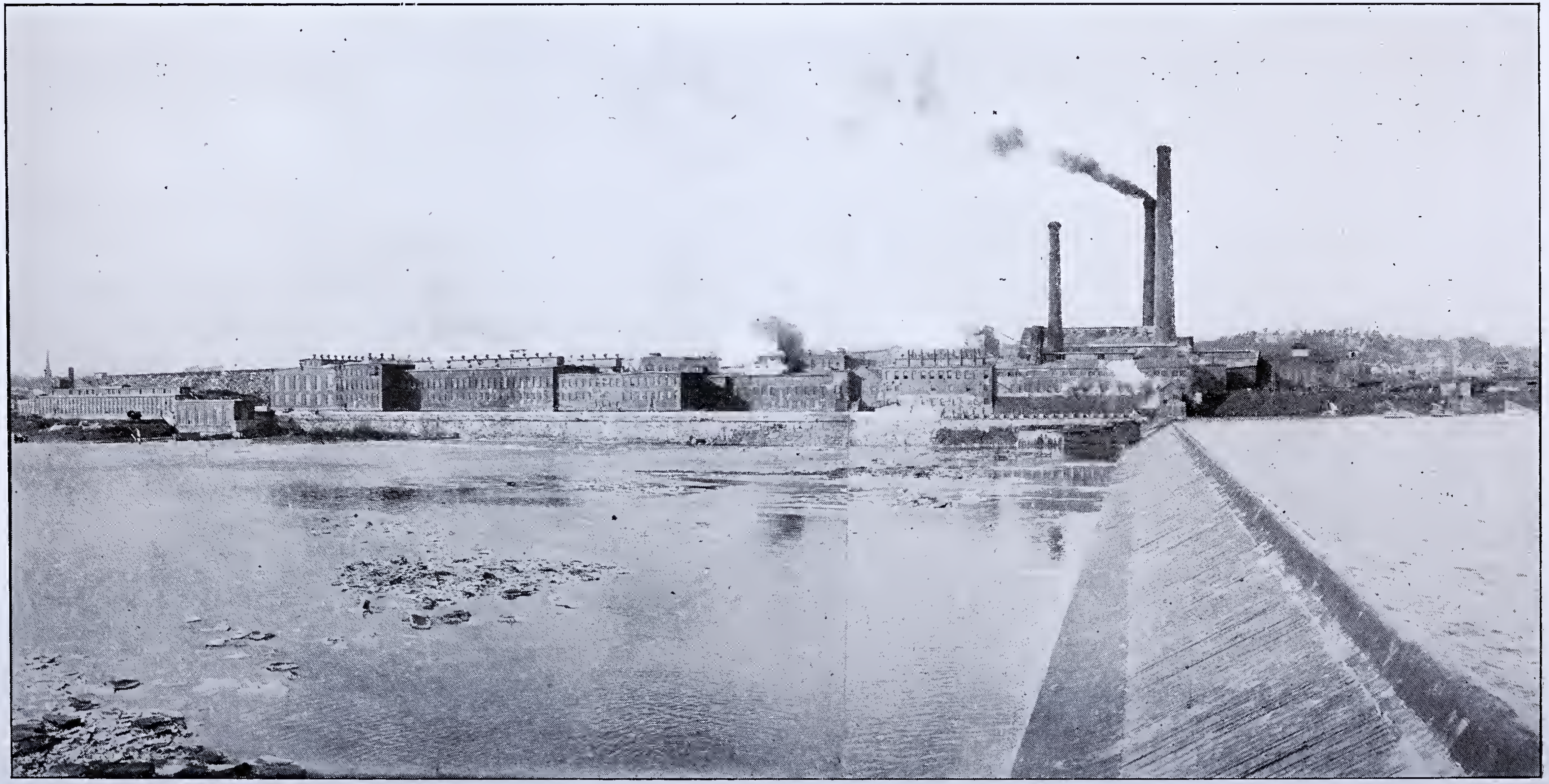
With the realization on the part of the State of the enormous value of its water resources there has arisen a determination to hold them for the benefit of all the people. This policy, strongly urged by Governor Hughes in 1907 in his first annual message to the legislature, was adopted in that year. In response to his recommendations the State directed the State Water Supply Commission to make investigations and surveys for the purpose of determining the possibilities and cost of water storage under State control. While this work is still in progress, the results already reached indicate that, excluding the Niagara and St. Lawrence rivers, which are international streams, less than half the water power that the State is capable of producing, has been developed. The figures are as follows:

	Horse power.
Water power now in use	620,000
Water power undeveloped	880,000
Total possible development	1,500,000

What the development of the waste power would mean under the reasonable plan proposed by the Commission may be shown as follows:

Annual rental value of waste power (at $5 per horse power)	$4,400,000
Annual interest and operating charge	$3,000,000
Annual net revenue to the State	$1,400,000
Additional population supported	1,000,000

Water power privileges of great value, amounting to 200,000 horse power at Niagara Falls alone, were given away to private in-



Hudson River — Dam and Paper Mills at Mechanicville.
West Virginia Pulp and Paper Company, one of the largest water power users on the river.

terests before the State awoke to the need for adopting a wiser policy. This thoughtless alienation of the public right has been abandoned and the most recent grant of water power rights contained conditions providing for definite fixed payments to the State for the privileges conferred.

For the improvement of its canals the State is spending $101,000,000 and for the construction of good roads $50,000,000 more. This money will not be repaid to the State in cash, although the return in increased values and commerical prosperity is expected to equal many times the investment.

The enlarged canals and the improved roads may be used by everyone in the State on equal terms and for this reason the State does not exact tolls for their use; but with water powers the case is different. While their improvement will in numerous ways undoubtedly add largely to the sum of commercial prosperity in the State, the prosperity thus gained can never be so widely or equally diffused as to justify the improvement as a public charge. Only a small number of persons can benefit directly from it. From the standpoint of the entire population of the State, its water powers, developed and controlled by the State, are an asset from which all the people can benefit equally only by obtaining a cash return to be paid into the State Treasury.

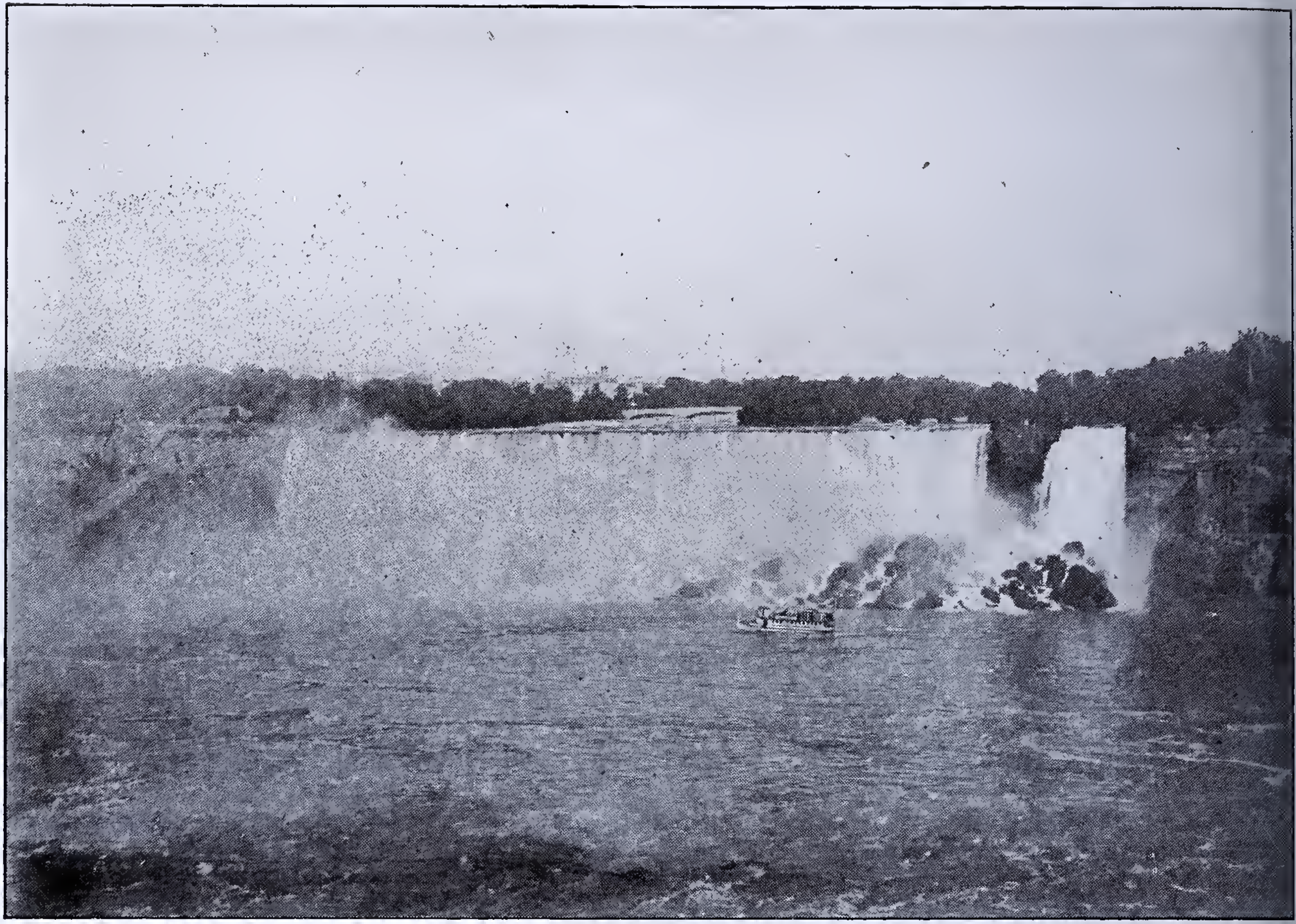
The right of the State to develop water powers may be likened to a large sum of money belonging to the State but locked up in a vault. The prosperity of the State would be increased if the State should loan or give this money to persons desiring to use it for the purchase of coal for their factories. There would be a larger number of factories and more persons would be employed. Of course the State does not loan or give away its money for such purposes. It puts the money at interest and uses the returns to pay the expenses of government. It would seem absurd for manufacturers to ask the State for cash and a similar request for an asset that is equivalent to cash should seem equally absurd.

For the development, then, of its resources of water power, it is proposed that the State shall authorize the issue of bonds to the amount of $20,000,000, every dollar of which, with interest, is to be repaid from the proceeds of the sale of the power produced. And when the work has been completed and paid for, it is estimated, as shown above, that the development will yield a large permanent income to the State.

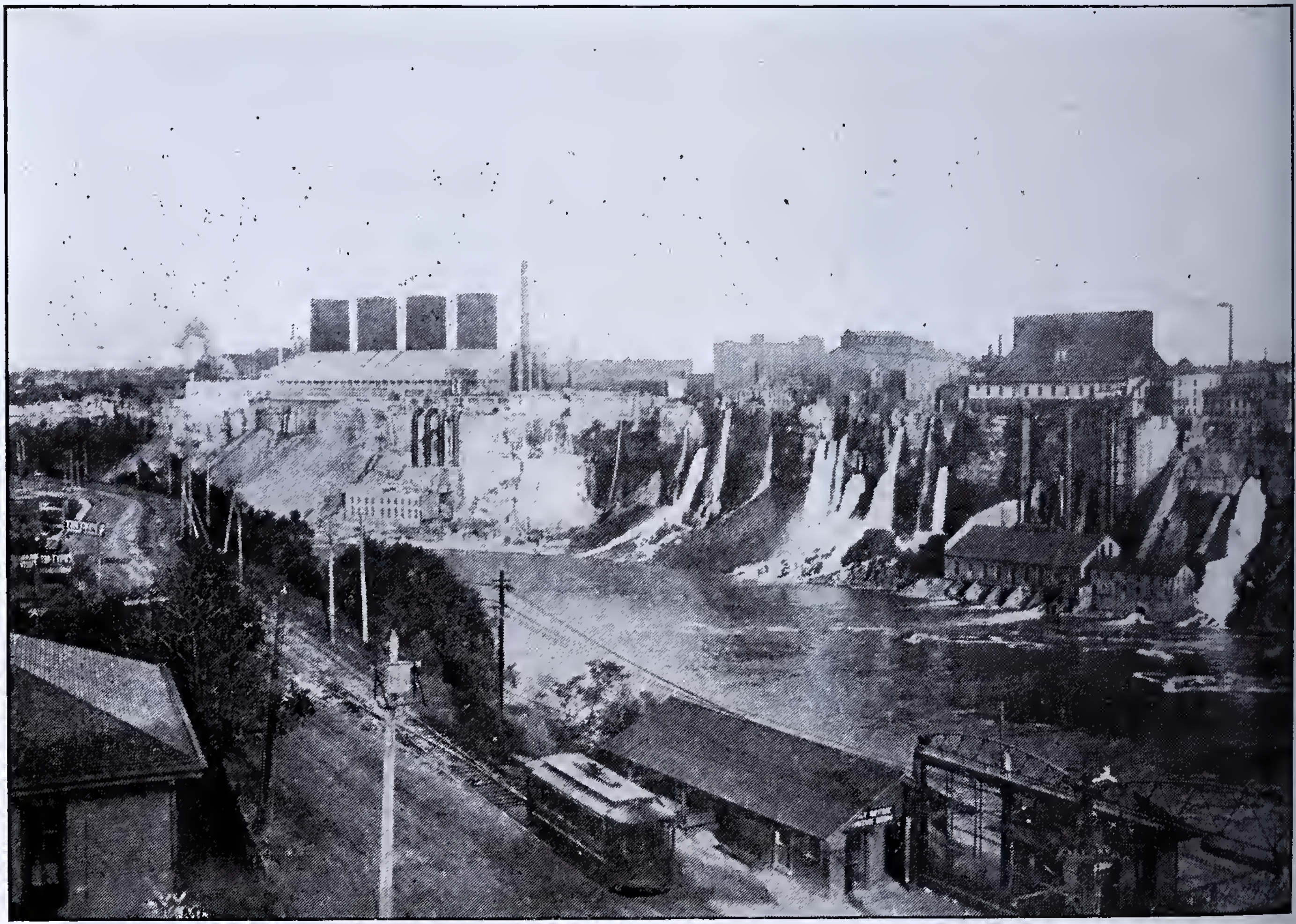
Although greatly distressed for lack of water for power, which can be furnished to them only by the State, the water power users, many of whom for years have enjoyed special privileges at public expense, have hitherto been unwilling to meet the terms proposed by the State. They have been able in the legislature to prevent the submission of the plan to the people.

They have not yet shown themselves entirely ready to accept the new State policy based upon the principle that the right of all the people in the water resources shall be held forever for the benefit of all the people.

This opposition has prevented the adoption of a reasonable plan of water power development in the public interest; but that it can long continue to block progress in this direction, when once the situation is fully understood, is not believed to be possible.



Niagara Falls — American Falls, July 22, 1908.
American power plants shut down, restoring 8,000 cubic feet of water per second to the falls.



Niagara Falls Hydraulic Power and Manufacturing Company's Plants.
Viewed from Canadian side.

II

Water Power Development.

Water power may properly be said to be a natural power. Water is drawn from the sea by the sun and winds, blows in clouds over the land and then descends in rain upon the hills and valleys alike. About one-half of the rainfall sinks into the ground or is taken up by vegetation. The other half runs off and finds its way into the streams, flowing out of the hills over rapids and cataracts on its way back to the ocean.

Every gallon and every cubic foot of water as it passes over these rapids and falls has in it an element of power, and this element is valuable in proportion to the volume of water which passes every minute and the height through which it falls. It follows therefore, that if each unit of volume and each unit of fall has a definite power value and increases with the increase of volume and fall, the power becomes valuable in direct proportion to the volume of water and the available fall at any given power site.

The value of power is also dependent upon the uniformity of the flow. A large flow and a great fall would be practically valueless for power development if the flow were only a short period of time. The nearer that the flow of the stream approaches a constant uniform volume, the nearer it approaches its ideal power value.

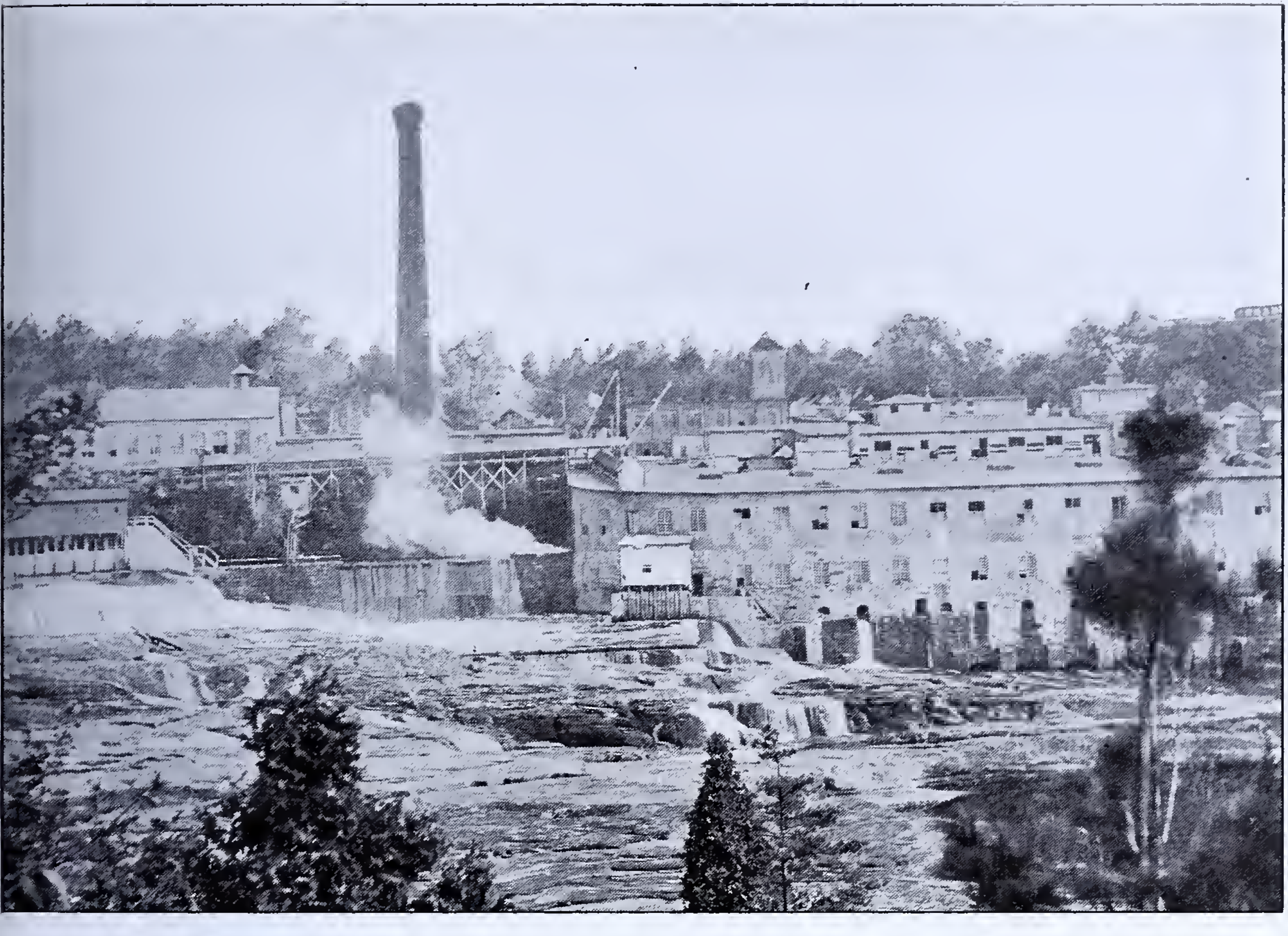
Power is to be found in innumerable falls throughout the State, but this power is only valuable to man when by his ingenuity and devices he extracts it from the water and makes it serve his purposes. Water power is a free gift to mankind by nature, but man must develop and utilize it at expenditure of both labor and money in order that he may reap the benefit. Power cannot be extracted from water without expense any more than gold can be extracted from the ore without the labor and expense of mining and smelting it.

In the State of New York, millions of tons of water fall from the clouds every year. By far the greater amount of this fall occurs in the later winter and spring seasons, and of the total fall at least one-half of it runs to the sea in a very short time. As this vast volume of water rushes down from the hills it becomes either a menace or a benefit to the people and the industries situated along the stream. When the volume is greater than the natural channel of the water course can contain, floods occur with consequent damage to property and danger to life and health, causing interruption of industrial enterprises, loss of time and money by the operatives and in many other ways bringing distress and discomfort. If, on the other hand, the natural channel is able to contain and carry off the water, a portion of it is used to advantage by the water powers and industries along the stream, but by far the greater portion of its value runs to waste. The high waters of the spring are also used for navigation, floating logs from the highlands to the mills, where they are prepared for commercial uses.

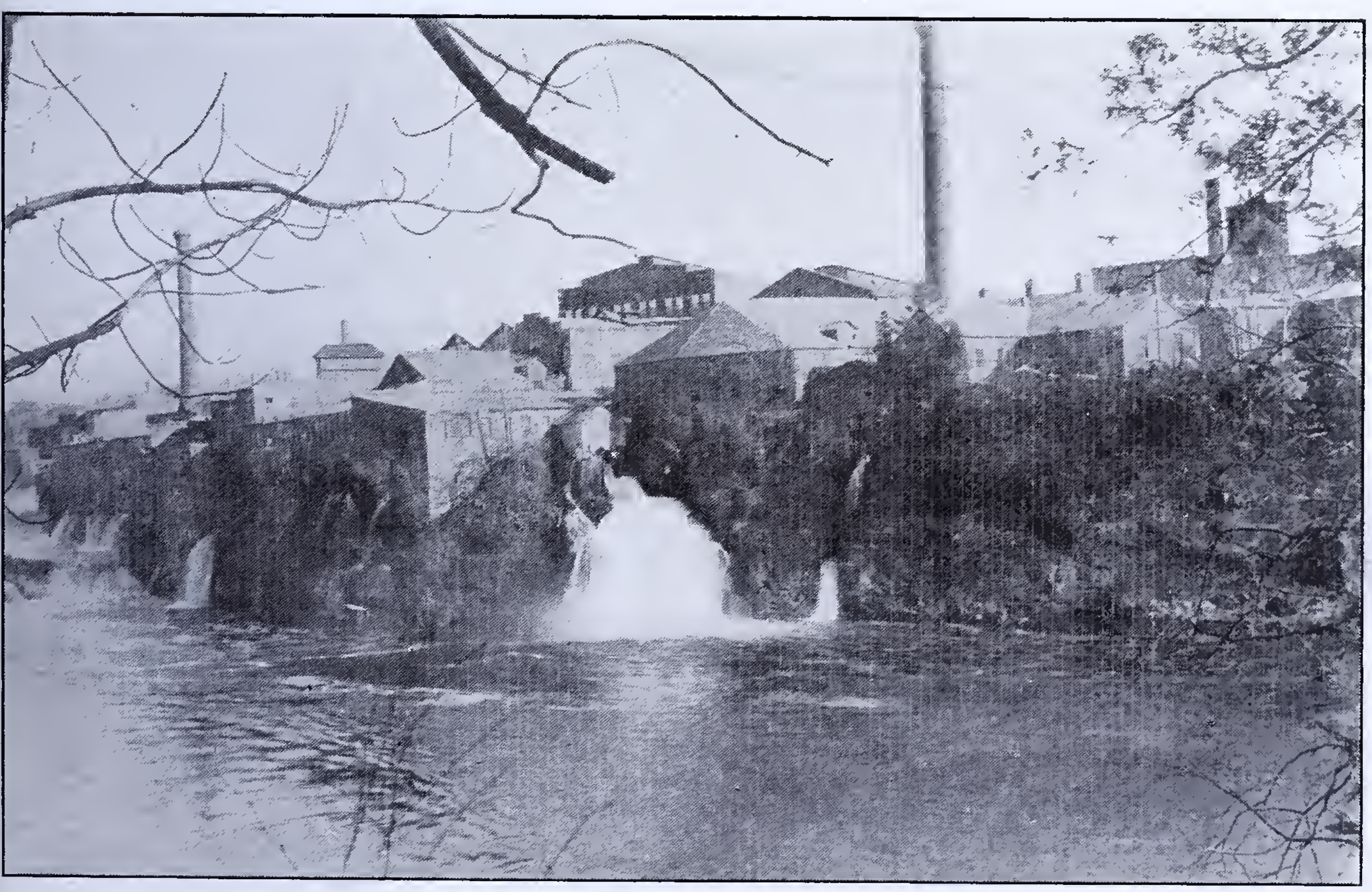
In most of the streams of New York State conditions occur as above described, and when the dry months of summer arrive, the opposite extreme occurs. The rivers and streams in the highlands become so contracted that they are practically useless for either navigation or power development, and when such conditions prevail industry is hampered, if not completely stopped, employees lose wages, and the value of the power development is greatly reduced.

Such extremes in the flow of our rivers occur annually, and as water powers are being made more and more valuable by the development of electrical science and the improvements in electrical transmission, the power users are calling for some system of regulation which will relieve them from the excessive high water in the spring and the excessive low water in the summer. Recognizing the force and meaning of the disadvantages of this unbalanced state of affairs in the natural distribution of the water in the rivers of New York, Governor Hughes in his first annual message called to the attention of the Legislature the necessity for some plan whereby the difficulties might be overcome. Acting upon the suggestion of the Governor, the Legislature of 1907 passed an act known as the Fuller Bill, directing the State Water Supply Commission to investigate and report (Chapter 569, Laws of 1907).

Immediately after the Fuller Bill became a law the State Water Supply Commission began the investigation of the principal rivers



Hudson River — Sandy Hill.
U. Bag & Paper Co., lower mill, showing succession of falls utilized for power



Hudson River — Sandy Hill.
Union Bag and Paper Company mills, showing same features as above.

and their tributaries to determine what, if anything, could be done to control the unregulated flow of these streams. During that year surveys were made on the Sacandaga river, a branch of the Hudson, and upon the Upper Hudson river, and also on the Genesee river above Portage.

It was found that a large reservoir could be constructed on the Sacandaga river with a dam at or near Conklingville which would impound 32,000,000,000 cubic feet of water and would prove of great assistance in the regulation of the flow of the Hudson river below Hadley, thus benefiting all the many industries using water power between Hadley and Troy.

It was also discovered by the surveys that the Genesee river, which is a very "flashy" stream, with a flood of 40,000 cubic feet or more per second in the spring and only 100 cubic feet per second in the summer, could be almost completely controlled by the construction of a large reservoir with a dam at Portageville impounding 18,000,000,000 cubic feet of water. The Portage reservoir would have a very beneficial effect upon the large power developments in the City of Rochester and the smaller development at Mount Morris.

As one of the essential elements in determining the water power value of a stream is the quantity of water to be dealt with, it becomes necessary to establish rainfall observation stations and stream gaging stations to determine, first, the amount of rainfall which occurs annually at any given station and its distribution through the months and days of the year, and, second, the amount of this rainfall that reaches the stream and the length of time consumed in the run-off. Upon the basis of the rainfall and runoff, computations are made to determine the amount of storage necessary for the control of the flow of the stream. And whenever a possible reservoir site is discovered, it is equally necessary to know whether or not the amount of the flow in the stream above the site of the dam will be sufficient to fill the reservoir during the flood season so that the water may be held and allowed to flow out during the dry season. New rainfall stations and new stream gaging stations were therefore established on the principal watersheds in the Adirondack mountains, and maintained and operated in coöperation with the United States Weather Bureau and the United

States Geological Survey, the expense being borne partly by the Federal Government and partly by the Water Supply Commission.

At the close of the season of 1907, a Progress Report of its investigations was made by the Commission to the Governor and the Legislature. A further appropriation for the continuation of the work was made by the Legislature of 1908 and during that season the investigations and surveys were continued on the Hudson, Sacandaga and Genesee rivers. The surveys were also extended to the Raquette, the Schroon and the Delaware rivers. The surveys made during the season of 1908 developed the possibilities of practical storage reservoir sites as follows:

Thirteen sites on the Upper Hudson river.

Three sites on the Sacandaga, which is a branch of the Hudson.

Nine sites on the Schroon river, which is also a branch of the Hudson river.

Eleven sities on the Raquette river and its tributaries.

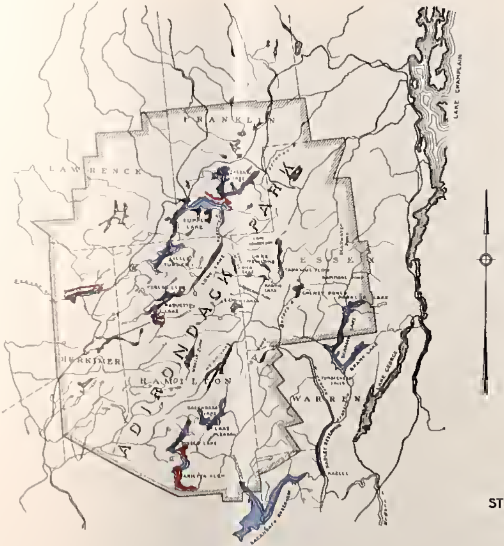
Three sites on the Delaware river.

Three sites on the Genesee river.

The surveys also developed a number of interesting possible power development sites on the above-mentioned rivers at which there is now no development.

During the season of 1908, an extensive power census was taken by engineers from this Department, who were sent to each of the principal streams and their tributaries in the entire State. These census-takers covered the whole territory, visited all of the plants which were developing 100 horse power or over, secured a large amount of data relating to them, and from this information a census of the State was prepared and printed in the Fourth Annual Report. This census disclosed the fact that at 1824 plants there is 620,000 water horse power actually in use in the industries of the State. These same plants have installed hydraulic machinery capable of developing 830,000 horse power, but owing to the irregularity of the stream flow this total amount of power cannot be developed except for a small portion of each year.

Extensive drill borings were made during the year at the dam sites on the Sacandaga, Schroon and Genesee rivers in order to determine the nature of the ground for a foundation for the proposed structures. The rain gaging and stream gaging was also continued and extended during that year.



~ Explanation ~

Proposed Reservoirs .... ▬
State Lands .... ▬
Adirondack Park Boundary ▨

This map shows the location of all Storage Reservoirs in this region which have been proposed in reports of the State Engineer and Surveyor by Mr George W Rafter C.E.

and

those investigated or proposed by the State Water Supply Commission

State lands are only indicated where they are included in the flowage area of a proposed reservoir. These areas are not drawn to scale but are exaggerated to make them discernable on this small scale map ~

STATE WATER SUPPLY COMMISSION
OF
NEW YORK

MAP SHOWING LOCATION OF STORAGE RESERVOIRS IN THE ADIRONDACK REGION

INVESTIGATED UNDER CHAP 569 - LAWS 1907

Walter McCulloh Consulting Engr.

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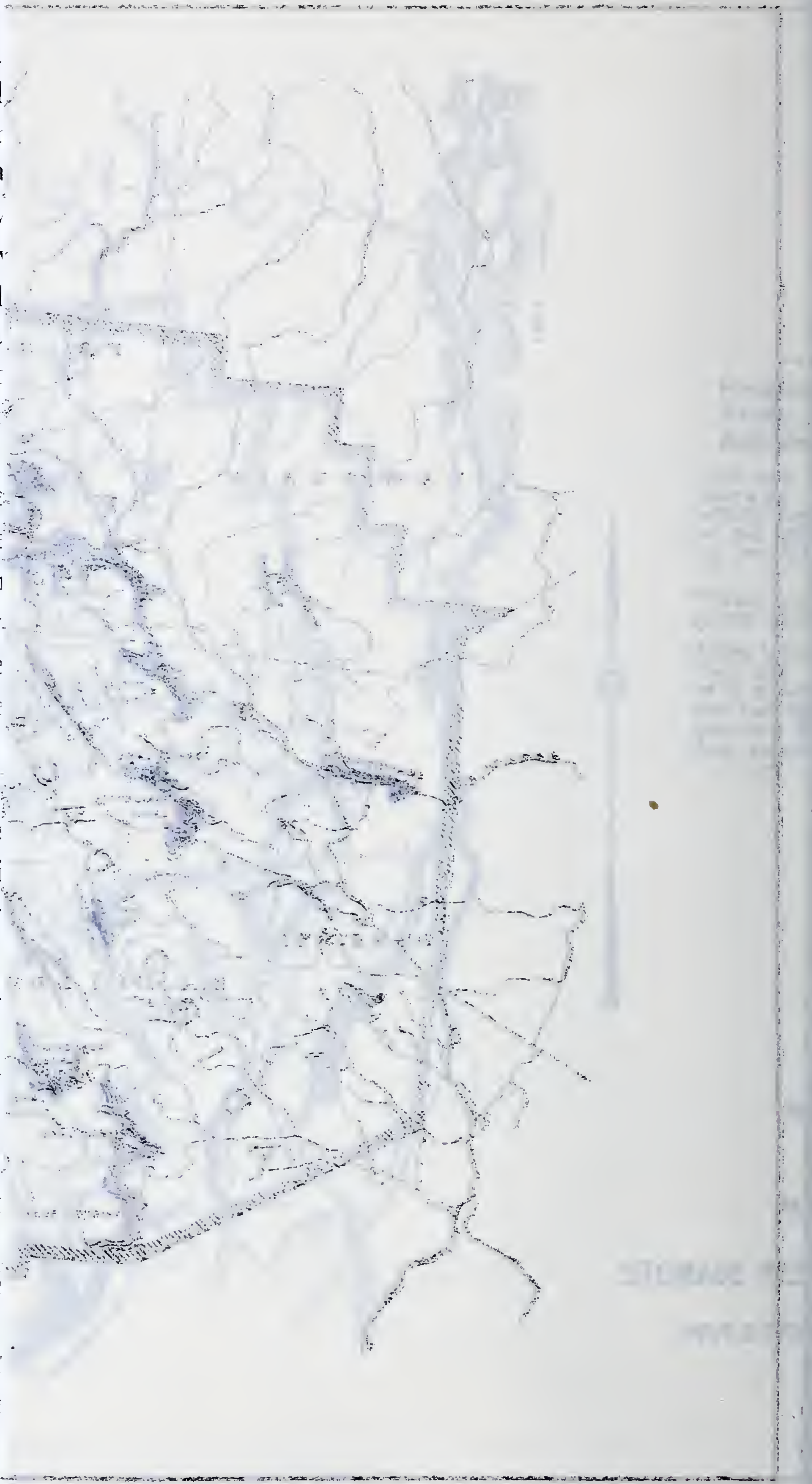


At the close of the year, a second Progress Report on the water power and water storage investigations was made to the Governor and Legislature. It is included in the Fourth Annual Report of the Commission.

The Legislature of 1909 made a further appropriation for the continuation of the investigations, which permitted the completion of many of the surveys for reservoir sites on the Raquette, the Schroon, the Sacandaga and the Genesee rivers. Also an extensive reconnaissance was made by the Engineering Corps of the water storage and water power possibilities on the following rivers: Black, Oswego, Oswegatchie, Grasse, Salmon West, Salmon North, St. Regis, Ausable, Saranac, Raquette, Allegany, Susquehanna, Chemung, Cattaraugus creek and the smaller streams flowing into Lakes Ontario and Erie, and streams flowing into Lake Champlain and Lake George.

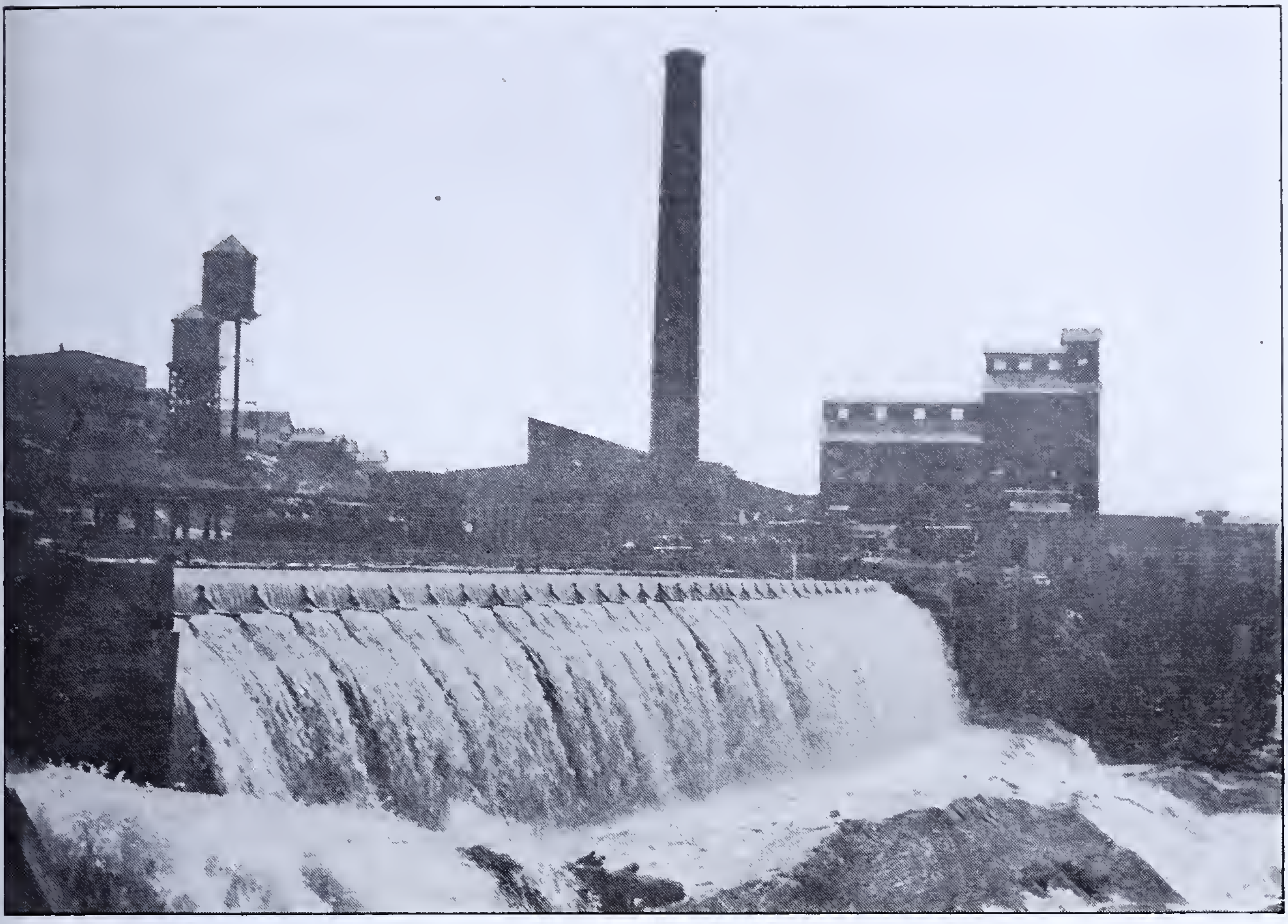
The surveys and studies of the possible storage reservoirs in the Adirondacks showed that many of them would involve the taking or flooding of State lands upon which the destruction of the timber is forbidden by the State Constitution. Surveys were made with the principal object of determining the actual amount of State land involved in all of the feasible reservoir sites within the Adirondack preserve and it was found that comparatively little would be required. The results of these surveys are set forth in detail in the Fourth Annual Report at pages 180 to 185.

One other very important feature in connection with the investigation of water power possibilities engaged the attention of the Commissioners and the engineers during the season of 1909. The Fuller Bill provided that the Commission, in connection with its report, should present a plan for the progressive development of the water powers of the State for the public use and benefit, and for a public revenue, and with this plan to present a bill for carrying the plan into effect. Such a plan and bill were prepared and presented with the annual report. The plan and proposed bill are set forth in great detail in the Fifth Annual Report.

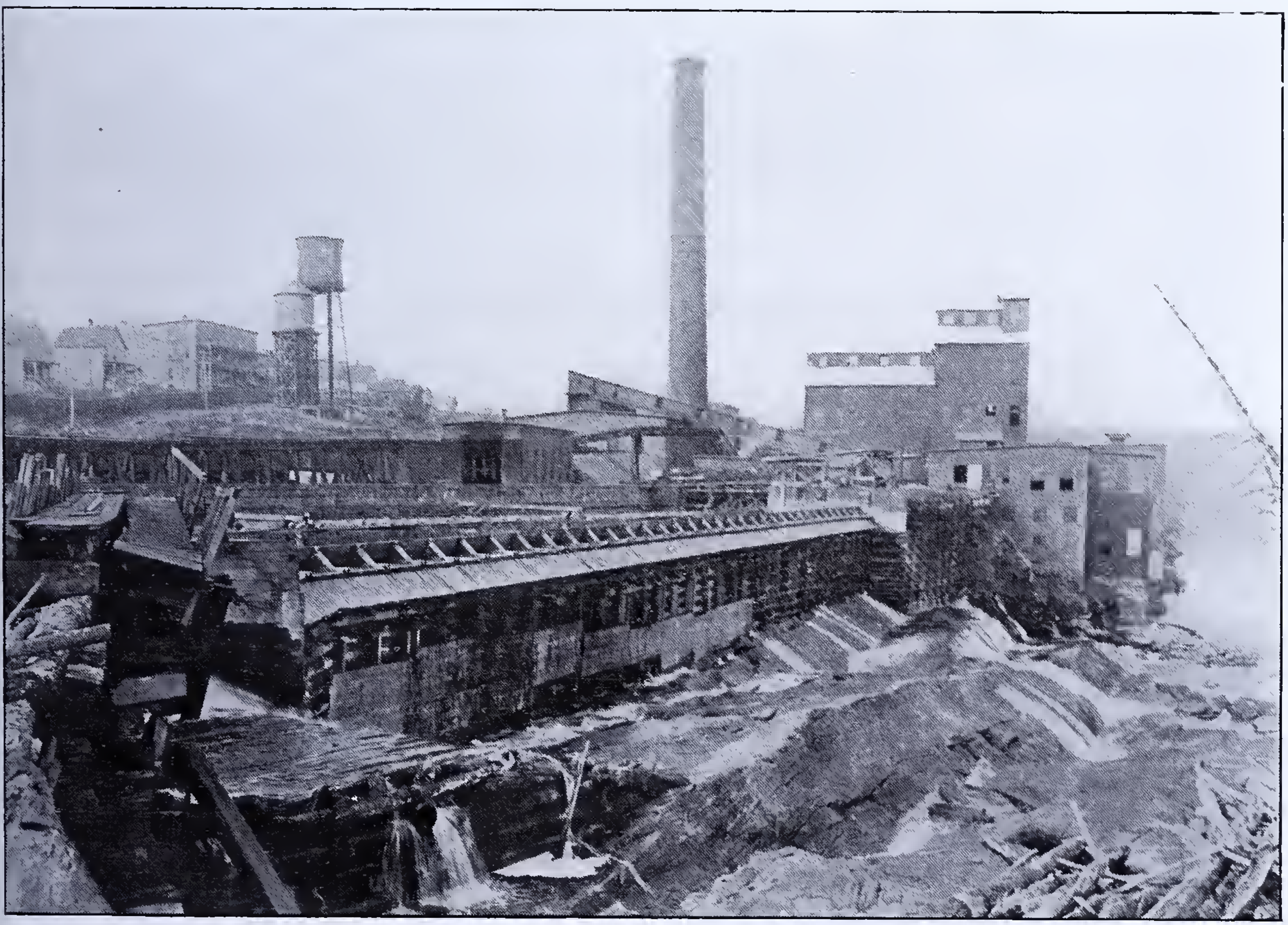
In the current year surveys are being made of the reservoir sites developed by the reconnaissance of 1909 on the Black river and its tributaries and on the Oswego and Seneca rivers. In the latter case the greater possibilities for storage lie in the " Finger

Lakes,"— the Seneca, Cayuga, Keuka, Canandaigua, Oneida, etc.,— but as these lakes and the Oswego and Seneca rivers have a very important relation to the water supply for the Barge Canal, the Water Supply Commission is limited in the amount of work that it can do in this watershed. The Commission is not prohibited by the law from making investigations, but it cannot include in its plan for water storage any work which might interfere with the Barge Canal plans.

Under a new agreement with the United States Geological Survey the stream gaging and rainfall observations have been largely extended this year, involving the establishment of some twelve new rain gaging stations and twenty-two new stream gaging stations. These new stations are established at points heretofore omitted from the observations but where definite data are very necessary.



Raquette River — Piercefield Dam.
High water wasting, June 5, 1908.



Raquette River — Piercefield Dam.
Low water conditions October 14, 1908. Paper mill shut down in consequence.

III

River Improvement.

The first step by the State in recent years toward improving its water courses for public benefit was taken by the Legislature of 1902 by the passage of an act creating the Water Storage Commission and assigning to it the duty of investigating and reporting upon the annual floods which had been occurring throughout the State. That Commission was also charged with the duty of determining, if possible, the damage which resulted from such floods and what means, if any, might be taken to prevent them.

The Water Storage Commission made a study of the flood situation and reported to the Legislature in 1903, presenting an excellent report, which included the plan of creating storage reservoirs for the purpose of flood control.

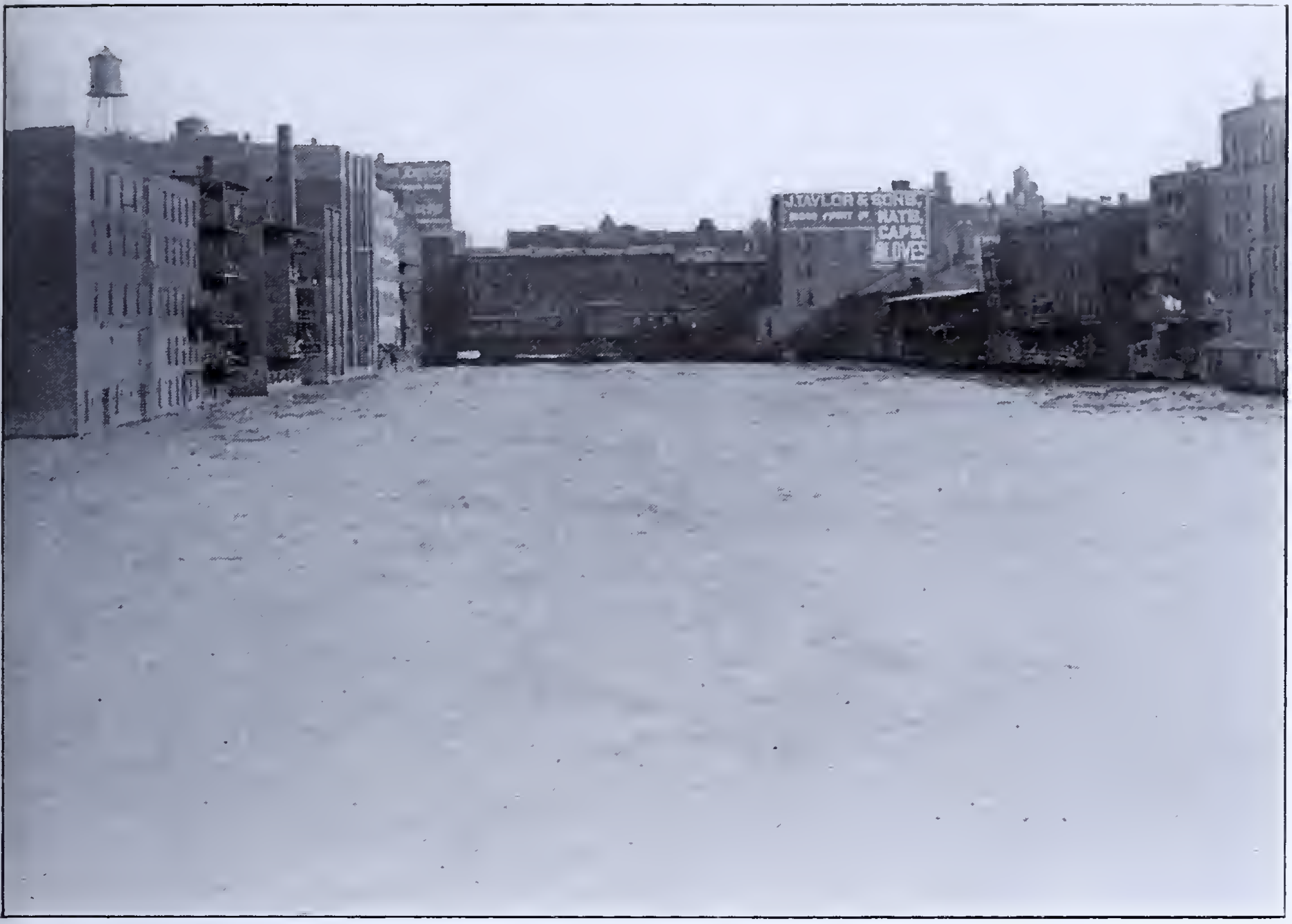
The next succeeding Legislature acting upon the popular demand for relief and the report of the Water Storage Commission, created the River Improvement Commission and assigned to it the duty of investigating the cause of floods and the possibility of their prevention on streams whereon the riparian owners, or towns, cities and villages might petition the Commission for relief. The acts and duties assigned to the River Improvement Commission, and the work to be done by it, were all based upon the right of the State to exercise its authority in the protection of the public health and safety. It therefore was the duty of the River Improvement Commission when acting upon a petition from any locality, to determine first, whether the relief prayed for was in the interest of the public health and safety, and second, whether the plan of relief was feasible. The bill prescribed the various steps of the procedure to be taken by the Commission in investigating, reporting upon and carrying out river improvement plans. Applications under the act were presented to the Commission from petitioners on the Raquette river, the Hudson river, Canaseraga creek, which is a branch of the Genesee river in Livingston county, and several other smaller streams. In 1906, the duties of the

River Improvement Commission were transferred by law to the State Water Supply Commission, where they have since remained.

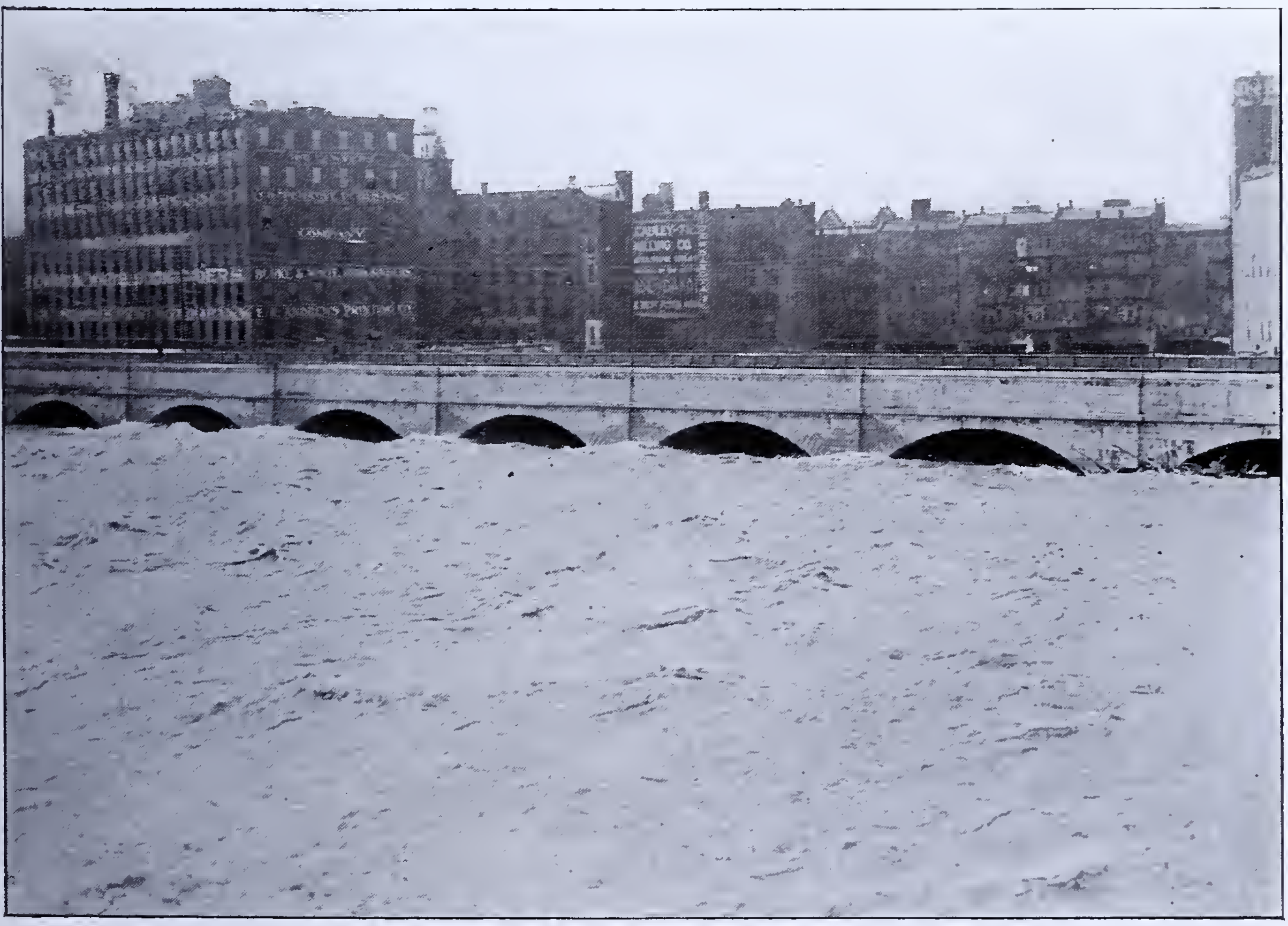
The river improvement project which has made the greatest progress is that of Canaseraga creek. The petition presented prayed for the deepening, straightening and widening of the Canaseraga from a point near the village of Dansville to the junction of the creek and the Genesee river in the town of Mount Morris, a distance of about twenty-two and one-half miles. In this valley, which is a marvelously fertile one, there are 11,000 acres of land subject to annual flooding. Sometimes twice and three times during the year this land is inundated. Surveys were made, plans prepared, estimates and maps were filed in the County Clerk's office as required by law, hearings have been held, and the proceedings advanced to the point where the plans have been approved and a contract awarded for the construction of dikes, dams, bridges and new channels, which will cost nearly $200,000 to complete. Bonds for the Canaseraga Creek Improvement have been sold to the extent of $200,000, and the work of construction will proceed as soon as the proceeds of the sale are available.

The cost of work done under the River Improvement law is borne by the counties, cities, towns, villages and individuals benefited, and by the State, if the Commission shall determine that the improvement is of such general importance that a part of the expense may properly be charged to the State at large.

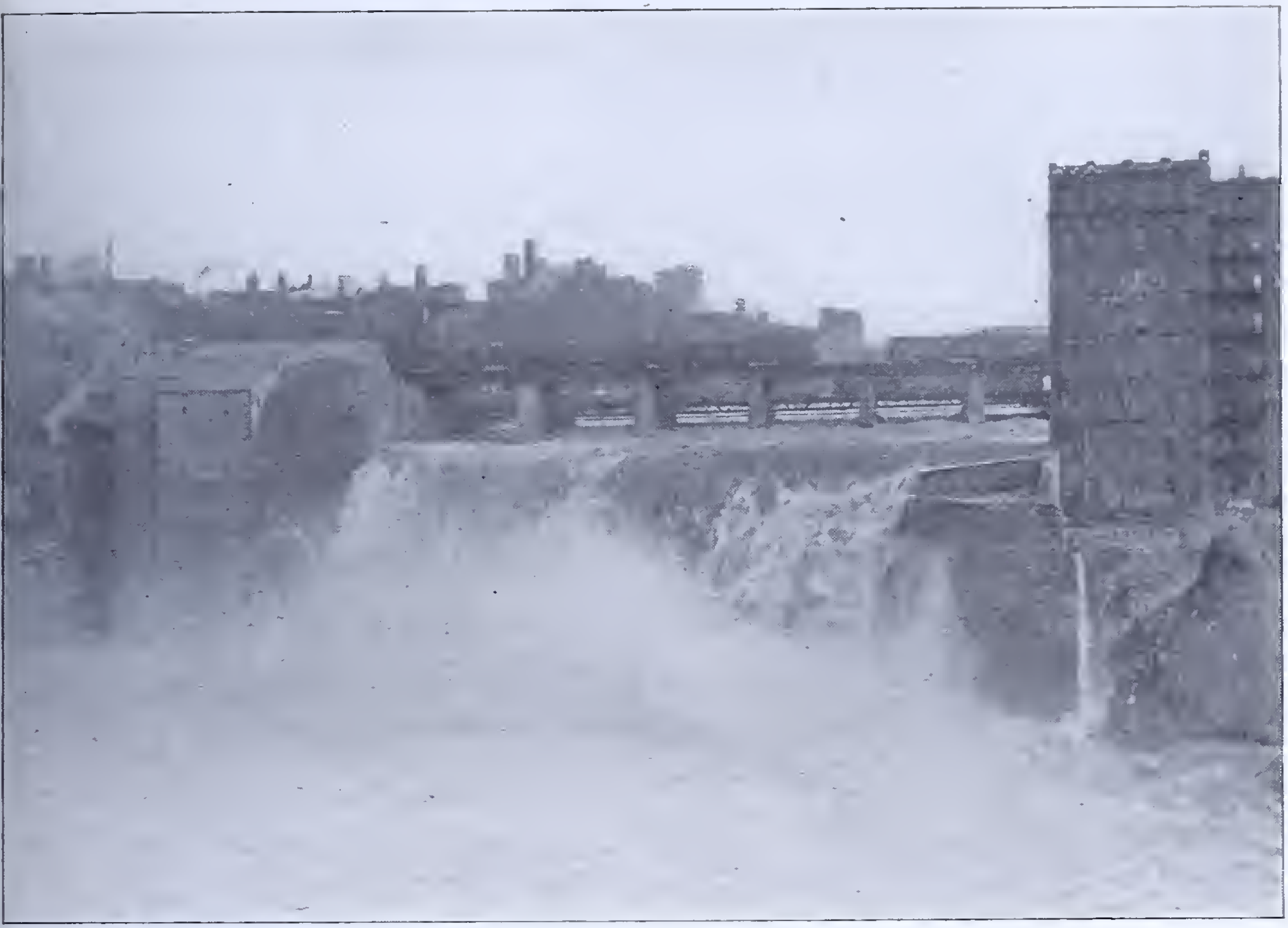
Applications for the improvement of the Genesee river have been presented to the Commission. The proposed improvement there is very extensive, involving the expenditure of $5,000,000. Surveys have been made and maps and plans prepared for the construction of a high masonry dam in the gorge of the Genesee river at Portageville, which would create a lake fifteen miles in length and nearly one mile wide, impounding water to a depth of 150 feet and containing 18,000,000,000 cubic feet. In the valley of the Genesee, between Mount Morris and the city of Rochester, the river winds and turns through a broad, fertile flatland containing from 25,000 to 30,000 acres. A large portion of this territory is flooded annually by the overflow of the river, and frequently the entire territory is completely submerged, resulting in the loss of crops and property, the washing out of the highways, and occa-



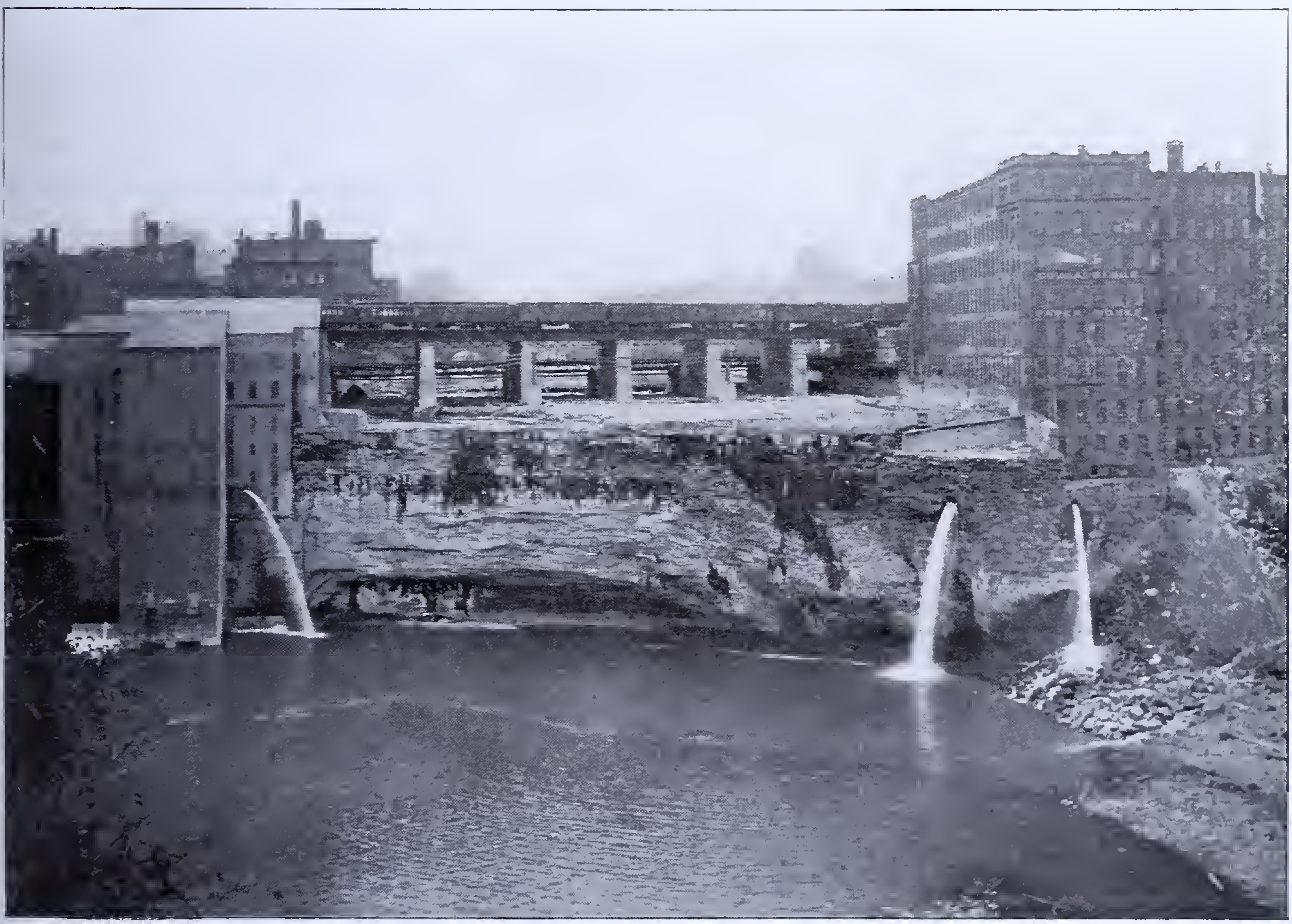
Genesee River — Rochester, May 4, 1909.
Flood at the Main street bridge reaching the danger point.



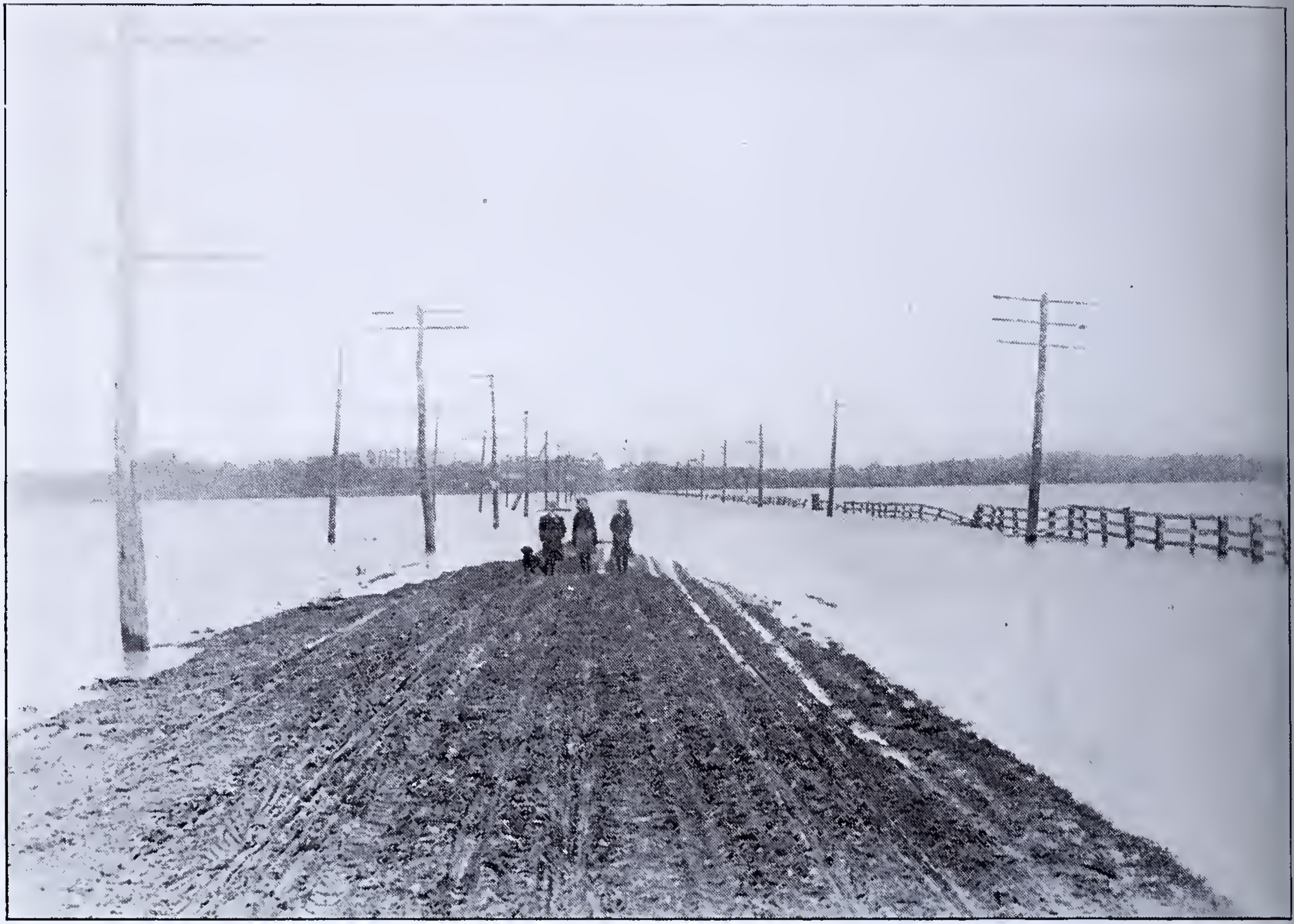
Genesee River — Rochester, May 4, 1909.
Erie canal aqueduct.



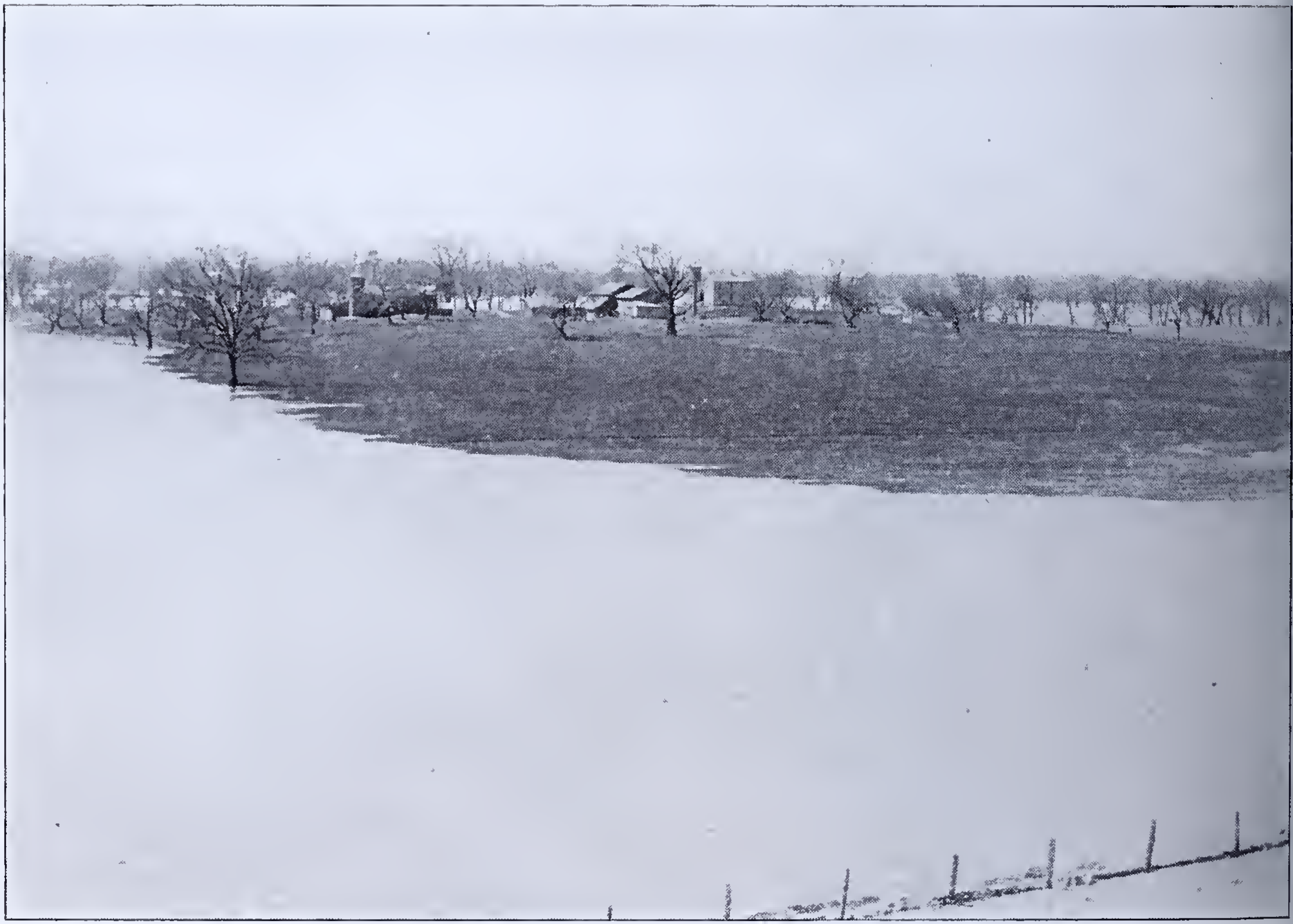
Genesee River — Rochester, May 4, 1909.
This waste of flood water would be prevented by the proposed Portage reservoir.



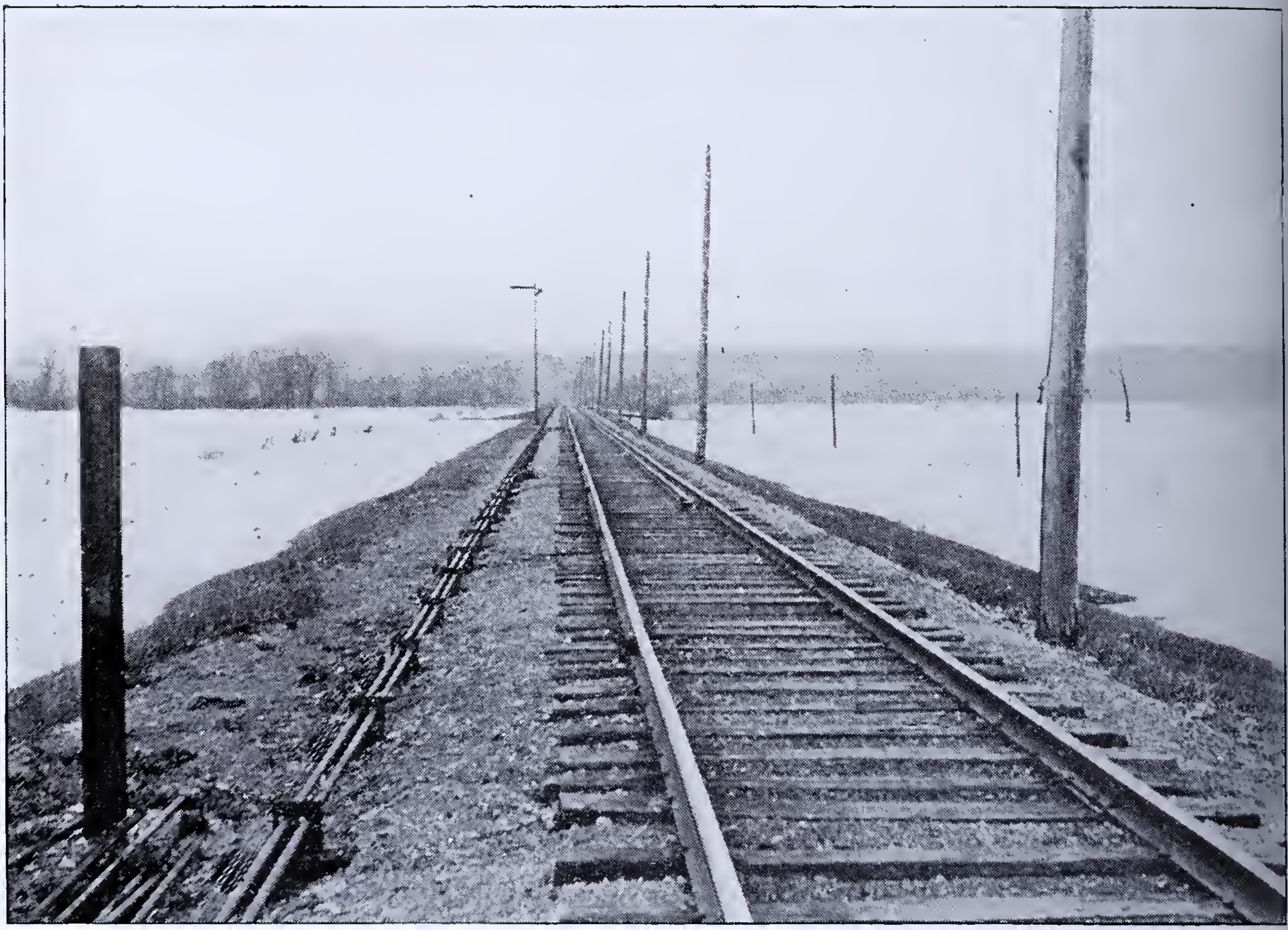
Genesee River — Rochester, October, 1908.
The site of the falls in usual summer condition.



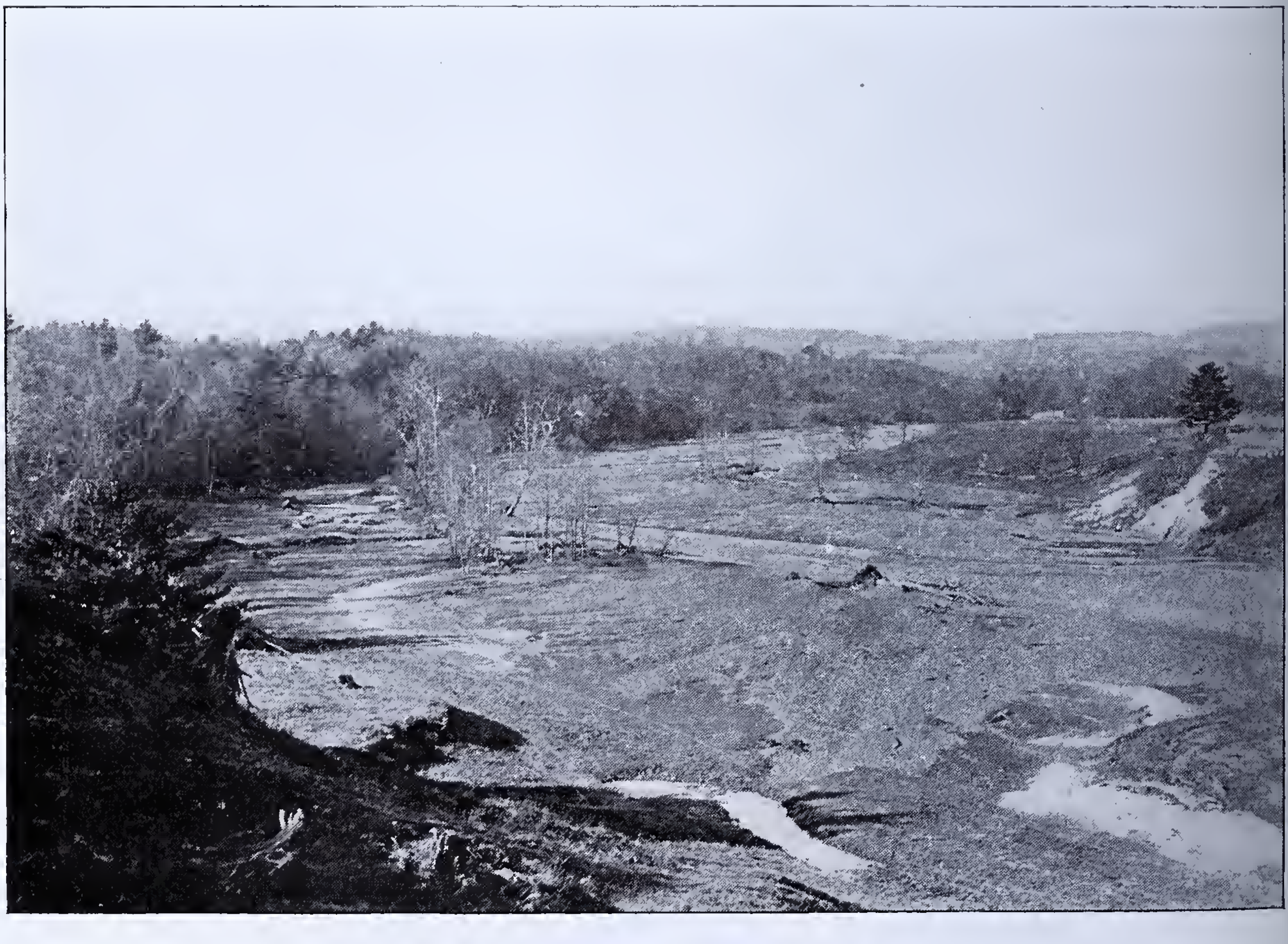
Genesee River — Avon Highway, May 3, 1909.
This condition prevailed for about three days.



Genesee River — New York State Industrial School Farm Near Oatka, May 3, 1909.



Genesee River — May 3, 1909.
Erie railroad, looking northerly from the Delaware, Lackawanna & Western railroad crossing.



Genesee River.
An example of damage done to farm land by floods.

sionally the loss of a highway bridge. The owners of the land are deterred by the anticipation of floods from making the best use of their lands for agricultural purposes.

The surveys and studies of the Genesee river in the flood season and the dry season lead to the conclusion that flood control cannot be effected by any reasonable system of deepening, widening or straightening of the channel of the river between Mount Morris and Rochester. Water storage seems to be the only solution for the Genesee flood problem. Surveys were made at various reservoir sites, but after considering them all it is the opinion of the Commission and their engineers that the Portage reservoir with a dam placed in the gorge near Portageville is the most feasible and practical method for the control of this river. By the construction of such a reservoir the farm land below Mount Morris will be protected against annual flooding, the flow of the river will be greatly increased during the summer months, keeping the stream purer, and materially adding to the health and prosperity of the Genesee valley.

In its last annual report the Commission took the position that it would be better not to attempt the Genesee improvement under the River Improvement Act but that the work should be authorized by an adequate law providing for water storage for power purposes under State control.

The control of the river as proposed would not only protect the public health and safety, but would be of great benefit to the various important power interests now situated on the stream, principally in the city of Rochester. The reservoir plan involves in the expenditure of $4,500,000, the building of a huge masonry dam over 200 feet high and 600 feet long, the changing of several miles of highways, and the relocation of fifteen miles of the Pennsylvania Railroad. It involves also the purchase of 10,000 acres of land.

The maps, plans, estimates and statements, as required by the law, are now nearly ready for filing in the county clerk's offices of the counties in which the proposed improvement will be made or its benefits realized.

IV

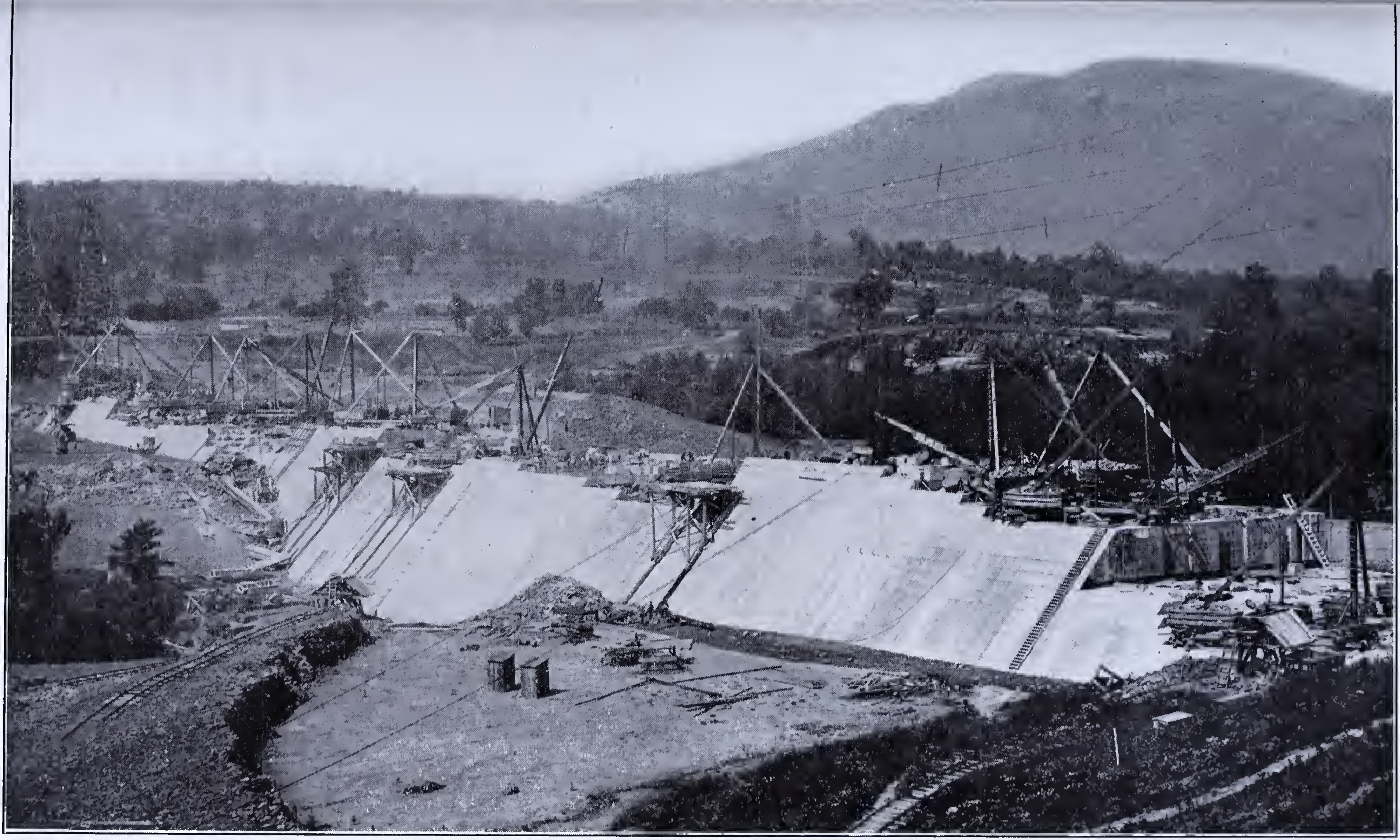
Water Supply.

Previous to the passage of Chapter 723 of the Laws of 1905, creating the Water Supply Commission, all cities, villages and other municipalities and private water companies constructing and maintaining public water works for municipal purposes were permitted to acquire land and water rights for public water supplies with more or less disregard for the rights of other municipalities which might have some claim upon the water thus acquired. In 1905, the City of New York, finding its growth in population so rapid that provision for additional water supply was necessary and realizing that the Croton watershed had been developed to its economical limit by storage reservoirs, began reaching out for new territory from which it might draw an abundant supply for its future needs.

The Legislature, in the act creating the Water Supply Commission, provided that thereafter no municipality or private water company could acquire a new or additional source of supply involving the taking of lands without first submitting its plans to the State Water Supply Commission and obtaining permission to carry them into effect.

The first and greatest plan presented to the Commission under this law came from the City of New York. It contemplated the expenditure of $161,000,000 in collecting water in the Catskill mountains and carrying it to the city through an aqueduct nearly ninety miles in length. After a thorough consideration of the proposed plans the Water Supply Commission approved them.

The plans contemplate the construction of a large dam on Esopus creek, near Olive Bridge, creating a reservoir to be known as the Ashokan reservoir. From this reservoir a masonry aqueduct, largely in a tunnel and at some points 800 feet below the surface of the ground, is being constructed under the hills and through the valleys on the west side of the Hudson river, to a point below Cornwall and near Storm King mountain. Thence, dropping to a



New Water Supply for New York City.
Olive Bridge Dam — Ashokan Reservoir.

depth of 1,200 feet, the tunnel will pass under the Hudson river, rising again on the east side to the level maintained before reaching the steep drop of the river crossing. The aqueduct tunnel will then pass under the hills, following the Hudson river on the east side, and into the valley of the Croton river, where provision will be made for the discharge of water into the large Croton reservoir if necessity arises. From the Croton the aqueduct runs south to the valley of the Bronx river in Westchester county, near the village of Kensico, north of White Plains. Here it is proposed to construct a second large dam to form an extensive storage reservoir into which water may be poured from the Catskill source and held in reserve for distribution in case it should be necessary to shut off temporarily the flow in the aqueduct. From the Kensico reservoir the tunnel continues further south to Hill View, near the city of Yonkers and just north of the northerly boundary line of New York City where another distributing reservoir will be built. Here the aqueduct proper will end. It will have a capacity sufficient to deliver at the Hill View reservoir 500,000,000 gallons of water each day of the year.

From the Hill View reservoir will start the main distributing tunnel and pipe lines for delivering the water to the various boroughs composing the City of New York. The main line, as contemplated by the present plans, is a deep tunnel in the rock, extending from the Hill View reservoir through the borough of The Bronx under the Harlem river into the borough of Manhattan and southerly under Central Park to a point near the lower end of the island. Thence it passes under the East river into the borough of Brooklyn, where the tunnel will end in a vertical shaft bringing the water to the surface under pressure controlled by a system of valves and gates. From this vertical pressure shaft large iron distributing mains will be laid from the borough of Brooklyn into the borough of Queens and other lines will pass south and west under the Narrows into the borough of Richmond.

Numerous shafts will be sunk on Manhattan island for the purpose of constructing this pressure tunnel, and they will be used for bringing the water to the surface, under pressure, for distribution through the distributing pipes existing in the streets. Each one of these shafts will constitute a center of distribution for a certain zone of consumption. The cost of the proposed pressure tunnel distributing system is estimated at $25,000,000, of which $20,000,000 is in addition to the $161,000,000 to be spent on the enterprise from the Ashokan dam to the Hill View reservoir.

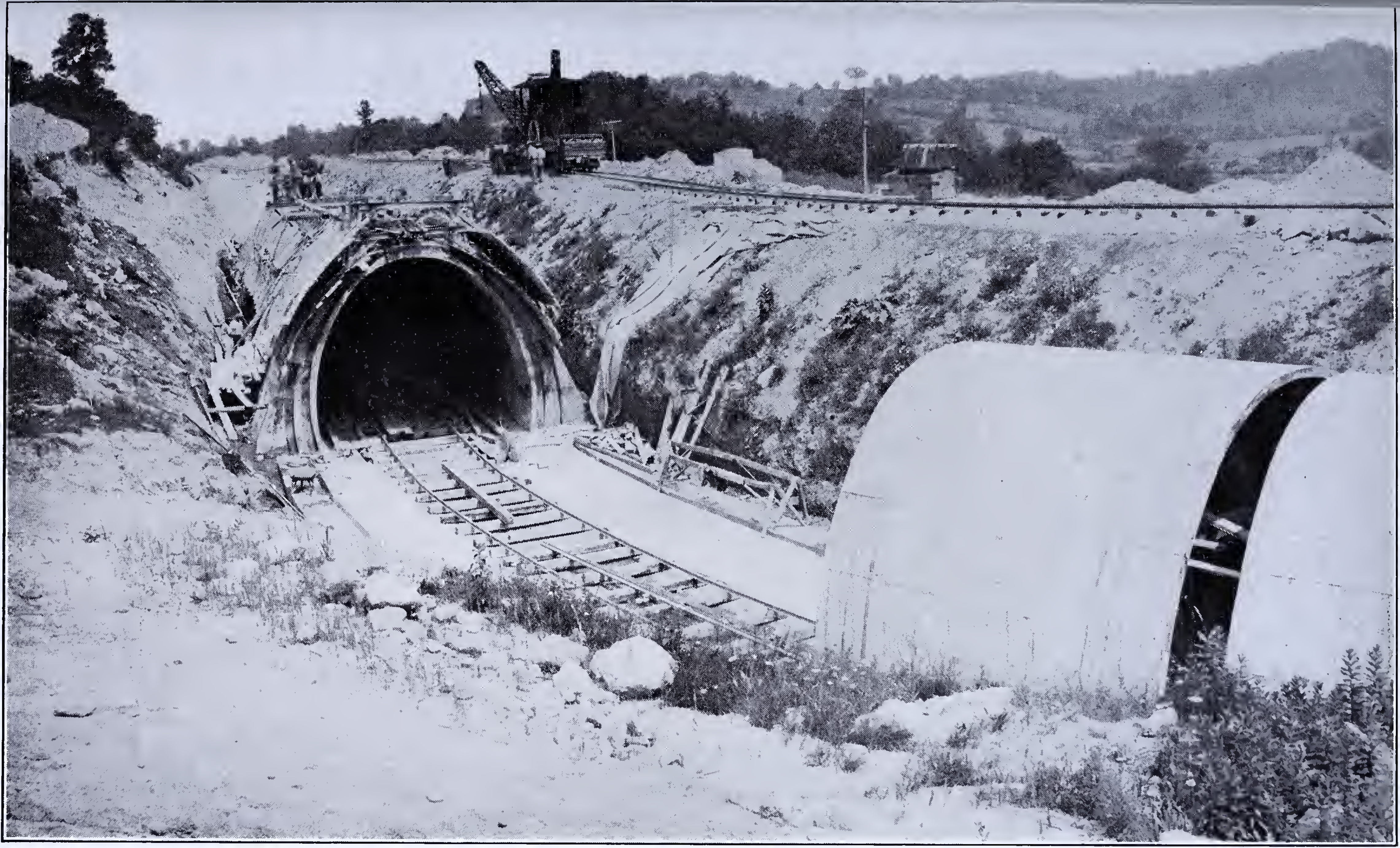
It is planned by the New York Board of Water Supply that as the population increases in the several boroughs of the city, extensions of distributing mains will be made from the Hill View reservoir and from the pressure tunnel to meet demands for water as they arise.

Many other important and interesting water supply applications have been made to the Commission since 1905 and acted upon. A summary of these applications, involving a total contemplated expenditure by the applicants of over $230,000,000, is set forth in the Fifth Annual Report.

Great good has been accomplished by the work of the State Water Supply Commission in its consideration of applications coming before it, both in protecting the interests of other municipalities which might have rights in the watersheds under consideration, and in guarding municipalities against taking impure or insufficient water supplies. In several cases a municipality has found that the plans which it contemplated were not really for its best interest and the suggestions and recommendations made by the State Water Supply Commission have secured for it a better and safer source of water supply.

Although the conditions in regard to public water supplies under the present water supply law are far better than they were formerly, there still remains important work to be done. One important matter which should receive attention and the protection of the State is that of the purity of the streams. Cities, towns, villages and industrial plants should be prohibited from dumping raw sewage and waste materials into and thus fouling the streams upon which other communities must depend for their water supply. State supervision over this matter for the protection of the public health and safety is regarded as most important.

Another matter which is demanding careful consideration is that of water rates. It is urged that these may be controlled by wise legislation by the State Water Supply Commission as rates for gas and electricity are now controlled by the Public Service



New Water Supply for New York City.
Typical section of Catskill Aqueduct.

Commission. Under such a system of State supervision water rates might be placed upon a sound economic basis, so that a municipality or private company operating a water works could be compelled to follow business-like lines, receiving a reasonable revenue for the maintenance of the plant, for interest upon the investment and for betterments and enlargements. At the same time the individual consumer would be protected against exorbitant charges and assured of an economical operation of the plant upon which he is depending for his supply of water.

V

Water in Agriculture.

The value of water on the farm has been fully recognized in those parts of the West where irrigation is essential to successful agriculture. Comparatively few experiments in irrigation have been made in New York State but the results of those that have been made indicate that in certain localities at least, irrigation may be employed to advantage in obtaining an increased yield from the land.

Speaking generally it may be said that in dry years irrigation may be used to procure a normal harvest and in this respect it is a means of insurance against loss. Irrespective of droughts, it may be employed with profit in the cultivation of light sandy and gravelly soils which occur in considerable area within the State. There is a tract of such land along the plains of Lake Erie and Lake Ontario where a sandy soil which may be watered from the lakes predominates. In the river valleys throughout the southern part of the State gravelly soils are found, often in the form of high level terraces, as in the Chenango and the Susquehanna river valleys in the vicinity of Binghamton. The Mohawk river might furnish water for the sandy tracts between Albany and Schenectady, and the Hudson and its tributaries for the area of sandy soil between Saratoga and Glens Falls. On Long Island, particularly the southern and eastern parts, the soil is so dry and light as to be now almost unproductive. It is believed that an adequate supply of water for profitable agriculture may there be procured by tapping the underground sources.

One of the best known experiments in orchard irrigation is that conducted by F. L. Lawson, registrar of the University of Rochester, on his Wayne county farm. In this experiment the water is pumped from Lake Ontario and conducted through a peach orchard in furrow-ditches. The trees thus irrigated yielded larger and more perfect fruit than neighboring trees that were not irrigated.

Another noteworthy experiment, often cited, is that made by Mr. Dell Titus, on his truck farm at Irondequoit, near Rochester. Comparing the uniform success of the crops grown in his well watered greenhouses with the varying yield of his summer crops, Mr. Titus determined to see whether he could not make extensive outside watering pay. He was compelled to pump the water required and he installed an elaborate system of piping, the entire plant costing about $3,500. His accounts show an annual return of 20 per cent. upon the investment. Similar experiments have been made on Long Island truck farms.

While the exact value of irrigation in the East and the conditions under which its use will prove profitable are still to be determined, it has probably been shown that it may be employed to advantage in many localities in connection with certain crops. The subject is receiving attention.

It is often possible to employ the water power of small streams advantageously in the production of electricity for farm use. The increasing demand for farm products and the difficulty of obtaining farm labor tend to stimulate the inquiry for labor-saving devices.

It has been shown that an electrical plant, requiring little attention, can be installed for a few hundred dollars and made to do a variety of work, from milking cows to running the sewing or washing machine. Such a plant, operated in this State by means of power derived from an old mill dam on a small brook, furnishes sixty electric lights, drives a milk separator, milks the cows, turns the grindstone, runs the fanning mill, grinds the feed, and cuts the ensilage. There are many other uses for electrical power on the farm.

Plants of this kind may be installed on a co-operative plan similar to that adopted for the construction of telephone lines in rural communities. Aside from the creation of power in available form, it has been pointed out that water storage ponds kept in suitable condition will furnish ice and may be used also for breeding food fish.

VI

Governor Hughes on Water Powers.

EXTRACTS FROM MESSAGES TO THE LEGISLATURE DEALING WITH THE POLICY OF THE STATE.

(*Annual Message to the Legislature*, 1907)

In this connection it is well to consider the great value of the undeveloped water powers thus placed under State control. They should be preserved and held for the benefit of all the people and should not be surrendered to private interests. It would be difficult to exaggerate the advantages which may ultimately accrue from these great resources of power if the common right is duly safeguarded.

By the act creating the Water Supply Commission it is provided that no municipal or public corporation or public board or any private person or water works company engaged in supplying any municipal corporation with water should acquire lands or additional sources of water supply save as the commission determines, among other things, whether the plans proposed are justified by public necessity and are equitable in their relation to other divisions of the State. It also has important powers with reference to river improvement. It remains to be considered whether it is not advisable to provide a more comprehensive plan, embracing in a clearly defined way the matter of water storage and the use of water courses for purposes of power. The entire question of the relation of the State to its waters demands more careful attention than it has hitherto received in order that there may be an adequate scheme of just regulation for the public benefit.

(*Annual Message to the Legislature*, 1908)

Under an act passed at the last session, an inquiry is now in progress through the Water Supply Commission with regard to the undeveloped water powers of the State. Means should be provided to enable this investigation to be completed with thoroughness. In the light of exact information, a proper policy with reference to the development and control of water powers should be established in order that these important sources of our prosperity may be held to the utmost extent possible for the benefit of all the people.

No grant should be made of water power privileges without compensation and under restrictions which will properly protect the rights of the public from whom the privileges are derived.

(*Annual Message to the Legislature,* 1909)

In my first message to the Legislature I recommended the consideration of the great value of our undeveloped water powers and the necessity of preserving them for the benefit of all the people of the State. At the session of 1907, the Legislature authorized the State Water Supply Commission to collect information relating to the water powers of the State and to devise plans for their development. With competent engineering assistance they have made valuable studies and their report to the Legislature last year, with that about to be made, deserves the most careful consideration. Of the horse power developed by water in the United States for manufacturing purposes it appears that twenty-seven and one-half per cent., or 446,134 horse power, is used in the State of New York. Facility in the transmission of electrical power has increased to an extraordinary degree the importance of water power for its development and the relation of our water powers to the industrial energies of the State. It has been estimated by the water supply commissioners that, excluding Niagara and the St. Lawrence, the rivers of the State with the proper storage of their flood waters are capable of furnishing at least 1,000,000 horse power for industrial purposes; and it is deemed clear that 550,000 horse power of energy is annually allowed to run to waste because no well-devised and comprehensive plan for the general and systematic development of water powers has been undertaken by the State. And the incidental advantages which would accrue from the regulation of our streams and the prevention of drought and flood are sufficiently obvious.

We now have within our grasp an opportunity which for the sake of the industrial freedom and prosperity of the future we should not permit to be wasted. These great natural sources of power should not only be developed in a manner which the State alone can make possible, but should be held for the benefit of the people under conditions which will ensure the protection of the common right and fair return for privileges granted.

The commissioners will submit to your honorable body special studies of particular water power development, which it appears may be made with reasonable assurance of direct pecuniary profit to the State, apart from the general benefits derivable from the policy of State control. It is believed that these studies have been made with skill and precision and the immense importance of the proposals will at once be recognized. They should be most carefully considered, and if we are to undertake the development of these projects and the prosecution of comprehensive plans, the necessary steps to secure the advantages which they promise should promptly be taken.

(*Annual Message to the Legislature,* 1910)

The Water Supply Commission is about to make a most important report of the result of its investigations under the act of 1907 relating to the development of the water powers of the State. An exhaustive examination, with the assistance of competent engineers, has been made of the Hudson, Genesee and Raquette river watersheds. Four great reservoir projects have been examined so as to furnish full detail with regard to location and design of dams and power plants, lands involved, cost and probable revenue and benefits. Additional studies have been made of other rivers which have importance as sources of power. Facts with regard to existing powers, the relative importance of different streams and the probable results of additional development and the market for increased power have been carefully ascertained.

It is estimated, for example, that complete regulation of the Hudson river with the storage required for that purpose would raise the present minimum flow of the river in a dry year from 900 cubic feet a second to a minimum of 4,600 cubic feet at Spier's Falls, and that with this increased flow and with full advantage of all power possibilities, the present development could be increased by 246,000 horse power. It is said that a low rate for the increased power would not only provide an adequate carrying charge for a complete system, but a considerable additional revenue to the State. One of the projects relating to the Hudson development is that upon the Sacandaga, the cost of which in the first stage, which can be dealt with separately, is estimated at $4,650,000. Its effect would be to add 1,900 cubic feet per second regulated flow to the river and an estimated increase of power upon a conservative basis of 85,500 horse-power. At five dollars per horse-power this would provide a sum sufficient to give a considerable revenue in addition to the annual charge for interest, sinking fund and maintenance. This apparently would not involve the use of the present forest preserve property of the State.

It is impossible here to state with any degree of fullness the interesting results of these important studies with respect to the practicability of these proposed developments in connection with the rivers of the State, and their advantage to the State. Some of the projects involve the use of a portion of the land within the forest preserve. But it is said that in all only 43,000 acres of land now owned by the State, including 10,000 acres of land under water (out of about 1,500,000 acres owned by the State) would be involved by the construction of all the reservoirs which it would be practicable to construct in the Adirondacks; and this includes many possible reservoirs which it would not be necessary or economical to build. Excluding the land under water, the greater part of the remainder of these 43,000 acres is described as low, swampy and valueless, and only about 8,000 acres is said to be really timber land.

The investigation has proceeded far enough to raise the question as to the action which should be taken by the State, and I commend this subject to your most careful consideration. The following principles should, I believe, be accepted:

(1) That the flow of water in our rivers should be regulated and our water powers developed to the fullest extent that may be practicable.

This is essential to prevent unnecessary damage from floods and to ensure our industrial progress and the future prosperity of our people.

(2) That with respect to streams having their headwaters within the boundaries of the forest parks, all plans of regulation or power development should be executed only by the State, and all reservoirs and their appurtenances and the impounded waters should be the property of the State and under exclusive State control, and not be permitted to pass into private hands.

Any such plan should embrace all necessary safeguards to ensure the proper protection of the forests.

(3) That with respect to any other streams flowing through any other public park or reservation of the State, such plans should likewise be executed by the State and it should retain exclusive ownership and control in order adequately to safeguard the State's interests.

(4) That further, as it is of great public importance that the water powers of the State should be developed in a comprehensive manner and that these natural sources of industrial energy should not become the subject of an injurious private control, such development should be undertaken by the State whenever such action appears to be feasible and for the general interest.

(5) That in any case of State development of water power provision should be made for the granting of such rights, as may be proper, to use the power so developed upon equitable terms and conditions.

(6) That the State should not undertake any plan of regulation or water-power development save upon a basis which would make its investment a fair and reasonable one from the public standpoint by virtue of practicable measures for ensuring such a return upon the State's outlay as would be equitable in the particular circumstances.

(7) That any amendment of the Constitution at this time for the purpose of permitting any portion of the forest preserve to be used for any such purpose should, by its terms, or by appropriate reference, suitably define the property within the preserve which is to be used and the manner of its use. No amendment and no plan of development should meet with any favor which, after the most rigid scrutiny, does not afford absolute assurance that in no way will the public interest in the forests be parted with or jeopardized.

(From an address before the annual convention of the New York State Waterways Association in Albany, November 30, 1909.)

It is very gratifying that in these recent years so much attention is being paid to the development of the means of communication, and to the conservation of our great natural resourses. The indomitable spirit and energy of the pioneers and settlers were sufficiently shown in the manner in which individual enterprise flourished and opportunities for developing the wealth of a great nation were utilized. But as we progress we find that the test of our capacity for self-government is in our co-operative skill and ability in developing those bases for individual enterprise and in conserving what is fundamental in our prosperity. In this co-operative effort the people are engaged according to the different forms of governmental organization. Some of the matters that we have to deal with can be undertaken only by the general government; some must be dealt with exclusively by the states, and others by both. The first point is to determine by careful analysis what ought to be done, and the next thing is to do it justly and by the best means of co-operation that our organized community affords.

* * * * * * * * * *

In my first message to the Legislature I called attention to the question of the development of the water powers of the State. We cannot here rely upon individual enterprise for the comprehensive improvement that is needed. We should not have water power in this State that could be utilized to advantage going to waste, and the figures which no doubt will be presented to you by one of the members of the Water Supply Commission, indicate to what an extent the water powers of this State are still unavailable.

Now this is not a matter to be dealt with haphazard, for the purpose of this little plan or that small individual project. We cannot afford to have the possibilities of a comprehensive plan interfered with by unrelated efforts prompted solely by the necessities of small occasion. The only way to deal with this, it seems to me — and it is time that it be dealt with — is to have the State control its undeveloped water powers, develop them according to the most improved method that science can suggest, preserve them for the benefit of all the people of the State in perpetuity, and let no individual or selfish hand control the sources of industrial power; and then provide fair means by which the developed powers can be availed of in individual enterprise. This policy is one which has received attention only very recently, and by appropriations made in the last few years inquires have been prosecuted and plans developed. I sincerely trust that this matter will engage the attention of your body, and if it commends itself to your judgment, that you will manifest your attitude in such a way as to impress the people of the State and create a proper support for needed action by the representatives of the people in an awakened public sentiment. In all these matters we are considering not any violation of individual opportunity, but the conservation of that opportunity by just co-operation. The man is as truly conservative with respect to individual rights, who desires co-operation through the action of the community — and indeed more so — than the one who would go unchecked purely along the line of individual ambition.

We have a growing State; we hardly stop to think of what it will be in fifty years from now; and however this or that matter may engage the attention of the moment, we will be judged by our children according to the way we act in the light of the necessities which they will know and feel. The subjects that you are dealing with in this conference are those that are not important simply for this generation and will perhaps add very little to the immediate advantage of those here present; but you are trying to conserve the interests of the people by wise planning and by that careful and statesmanlike foresight which will enable posterity with justice to rise and call you blessed.

VII

Water Power Legislation.

ADOPTION BY THE STATE OF A DEFINITE WATER POWER REVENUE POLICY.

Following the recommendation made by Governor Hughes in his annual message of 1907, the Legislature passed a bill, which became a law and is known as the "Fuller Act," from the name of the Senator who introduced it.

This law committed the State, for the first time, to a definite policy regarding the conservation and development of water powers. It "authorized and directed" the State Water Supply Commission "to devise plans for the progressive development of the water powers of the State under State ownership, control and maintenance for the public use and benefit and for the increase of the public revenue." When it is remembered that the State, before the enactment of this law, had been giving away water power franchises in perpetuity to all applicants with persistence or influence enough to obtain them, it will be seen that the Fuller Act was a long step in advance.

It directed the commission to investigate all the water powers in the State and to report upon them in the order of their availability, giving in detail the amount of power to be developed in each case, the cost of the development and of maintenance, and the probable revenue to the State. In its final report the Commission was directed to submit the draft of a general law providing specifically for the development of water powers by the State. As outlined by the act, this general law must provide for a bond issue to be authorized separately for each separate improvement and a tax upon the property benefited sufficient to pay the interest and principal of the bonds.

This plan follows the plan adopted by the National Government in the reclamation of the arid west, under which the money advanced is repaid into the treasury.

The Fuller Act distinctly contemplates the sale of the power developed by the State upon terms to be readjusted at suitable intervals. It appropriated $35,000 for beginning the work of investigation.

In the same session of the Legislature the State again definitely committed itself to the policy of demanding payment for water power franchises. Application was made by a corporation for authority to construct an electrical power plant on the Long Sault rapids in the St. Lawrence river. The Governor refused to sign the bill unless provision was made in it for payment to the State of compensation upon a sliding scale in proportion to the amount of power developed and such provision was made.

Detailed studies of the most important water power sites having been completed by the Water Supply Commission, it reported to the Legislature of 1910 a bill for a comprehensive general law, providing for the issue of bonds as required up to a total of $20,000,000, for the sale or lease for stated terms of the water or power developed, and for the annual assessment of property benefited. The bill, after receiving the signature of the Governor, was to be submitted to the people and could not become effective until approved by the people at the polls.

Much consideration was given to this bill. It soon became apparent that some of the power users who had been urgent for the State to undertake the work of development were unwilling to accept the policy to which the State had committed itself. They were willing to pay an assessment sufficient to meet, in fifty years, the interest and sinking fund charges on the bonds, but they insisted upon the right to use the water power for nothing and in perpetuity after the State had been reimbursed for its outlay.

This opposition was strong enough to kill the bill presented by the Water Supply Commission and the enactment of an adequate law which would turn to account the work of investigation for which the State had expended upward of $100,000 was postponed.

But so great is the need for more water power development that the power users induced the Legislature to pass a bill which attempted to give them what they desired by amending the River Improvement Act. This act became a law several years ago and it provides that, when the public health and safety are endangered by the flow of a river, the Water Supply Commission may make such improvements as will remove the danger. The cost of such an improvement is assessed upon the property benefited, although the State may assume it in part. There is no provision for a revenue to the State. The bill that was passed sought to use this machinery for power development purposes. In regard to compensation to the State, it conceded power to the State to collect a revenue which should never exceed five per cent. upon the original cost of the improvement. On the other hand, the power users were to be exempt from taxes upon any increase in the value of their property caused by the improvement.

Governor Hughes vetoed this bill and in the memorandum accompanying his veto he said:

"The purpose of this bill is to facilitate the making of important water power developments under the provisions of the statute relating to river improvement. The River Improvement Act was designed to relieve conditions menacing the public health and safety and it may be questioned whether in any event it would be adequate to the plans contemplated by this measure.

"It is apparent, for reasons which I have repeatedly stated in my messages to the Legislature, that there is need for appropriate legislation to secure the advantages which would flow from water power development, not limited to mere considerations of public health and safety. We should have a comprehensive scheme so that the sources of industrial power in this State may be properly availed of; and that we may have that extension of industry under conditions safeguarding the public interest which will greatly promote the common prosperity.

"This bill, however, presents no such plan and, in what it does provide, is plainly unsatisfactory.

"It is suggested that it contemplates cases where the entire cost of the improvement is to be borne by municipalities and individuals benefited and not by the State; still it is not so limited and is an amendment to the general law which provides for contributions by the State as well as by municipalities and individuals where it appears and is determined that the State should bear a portion of the expense.

"The provision made by the bill for State control over the improvement is inadequate. We have already in the law (State Boards and Commissions Law, section 21) the general provision that 'The care, control, operation and maintenance of improvements to rivers and water courses provided for in this article shall devolve upon the commission.' This, although general, may be sufficient for the sort of river improvement that was in view when the statute of which this provision forms a part was enacted; but if the River Improvement Act could be treated as sufficient in scope to embrace the large projects of water power development now contemplated, the relation of the State should be more definitely prescribed.

"This bill first provides that 'the title and ownership of all lands, properties and interests taken for such improvement' shall vest in the people of the State of New York 'after the payment of the final assessment under the provisions of this article for the cost of an improvement, including bonds, certificates and other liabilities incurred.'

"As the bonds, under the statute, may run for fifty years, this language contemplates in such a case the vesting of title in the State at the end of the fifty years, when the bonds are finally paid. The reference is to 'lands, properties and interests taken for such improvement.' If lands, properties and interests had already been taken, in making the improvement, under the provisions of the act relating to purchase and condemnation by the Commission on behalf of the State, it would seem that the title had already been acquired. If the bill refers to other properties, the question at once occurs, what properties are meant and what precisely is to vest in the State when the bonds are paid? In this respect the bill is altogether too vague and uncertain.

"The bill further provides that 'after the levy of the aforesaid final assessment' the Commission shall annually determine 'the amount of benefit collectively received by the lands, properties, interests and municipalities, which amount however shall never exceed a sum equal to five per centum per annum upon the original cost of such improvement.' The said amount is to be collected and paid over in the same manner as provided for the collection and payment of the original cost of the improvement, and is to be paid, after the deduction of expenses and maintenance, into the treasury of the State for the benefit of the general fund.

"The language I have quoted of course does not mean that the actual benefit received by the properties, interests and municipalities benefited shall never exceed the said five per cent. It means that, whatever the actual benefit may be, the State shall not be permitted to obtain a larger annual return than the said five per cent, and this is provided with respect to a period perhaps fifty years hence.

"The intention evidently is to secure the application of the River Improvement Act to projects of water-power development by the inducement afforded by this provision for a return to the State. The bill admits the principle that there should be a return to the State upon the improvement, but admitting the principle, there appears to be no justification for the limitation provided for in the bill.

"If the State is to make assessments annually for benefits derived from the water-power development, it is plain that these benefits should be determined justly and that the assessment should be fixed fairly with respect to them. This bill provides no adequate machinery for these purposes, but simply imposes now an arbitrary limitation with respect to what may be fair in the future, say at the end of fifty years.

"The bill further provides that 'lands, properties and interests' while subject to taxation under the provisions of the statute, 'shall not be assessed for general taxation upon any increase in the value thereof by reason of any such improvement.'

"Such a measure cannot be approved. So far as the State is concerned, it is vague in part and unduly restrictive in part. So far as water-power development is concerned, it does not afford an adequate scheme to relieve the necessities of industry or to meet the wants of the people.

"I have been very desirous that there should be a proper plan by which our water powers can be developed on a basis fair to all; but the details of such a plan need to be worked out carefully, and I do not believe this can be done by a mere addition to the River Improvement Act."

As the plans devised by the State Water Supply Commission in accordance with the law involved the flooding of a small area of forest land belonging to the State in the Adirondack Park for the construction of important storage reservoirs, the amendment of the Constitution was required. This was necessary because the Constitution at present forbids the destruction of any timber owned by the State in the Park. Much regret was felt by those interested in water power development by the State on proper terms at the failure of the bill proposed by the Commission. There was even more disappointment when it was found that the proposed amendment to the Constitution was not only so vague as to be of doubtful value but was so drawn as to ignore the policy of the State in regard to revenue from power development.

The amendment — to section 7 of Article Seven — was introduced by Assemblyman Edwin A. Merritt, Jr., of St. Lawrence, leader of the majority in the Assembly. It was approved by the Legislature of 1910 and must be approved by another Legislature before it can be submitted to the people for adoption. It reads as follows, the proposed change being printed in italics:

"Forest preserve. § 7. The lands of the state, now owned or hereafter acquired, constituting the forest preserve as now fixed by law, shall be forever kept as wild forest lands. They shall not be leased, sold or exchanged, or be taken by any corporation, public or private, nor shall the timber thereon be sold, removed or destroyed. *But the legislature may provide by general laws for the construction and maintenance of reservoirs under state control on such lands whenever the storage of water is necessary for municipal water supply, for the canals of the state or to regulate the flow of streams. No reservoir shall be erected under any such law until after the appellate division of the supreme court for the department in which it is to be located shall after a hearing adjudge the use of state land therefor necessary for the public welfare. The people and, with the consent of the court, private persons may come in as parties to the proceeding and the court may impose such conditions as in its judgment the public interest requires. The judgment may be reviewed by the court of appeals. If rights or property of the state be taken or used for any such improvement other than for the canals, the value thereof or of their use shall be a charge upon the property or municipality directly benefited and must be paid into the state treasury in gross or by annual fixed charge as shall be provided by law. The expense of any such improvement to regulate the flow of streams shall so far as it improves private property be borne by such property to the extent of the benefits received. Unsanitary conditions shall not be created or continued by any such reservoir. A violation of this section may be restrained at the suit of the people or with the consent of the supreme court in appellate division on notice to the attorney-general at the suit of a citizen.*"

It will be noted that the amendment does not mention power development as one of the objects to be attained by water storage and that it does not authorize the assessment of private property excepting for the cost of the improvements. The State's policy of deriving revenue from power development is entirely omitted.

There has already arisen strong opposition to this amendment as unjust to the interests of the people of the State.

From the foregoing statement of facts it will be seen that the conservation and development of the State's water resources has been for the present blocked by the very interests that will most profit from it.

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